

Grade 5 Advanced Workbook

20 lessons · printable · answer key at the back

Name _____ Date _____

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Decimal Place Value

WORKED EXAMPLE

 $1.\underline{4}92 \rightarrow \underline{0.4}$

1. What the digit is worth

Write the value of the highlighted digit.

- | | | |
|----------------------------|----------------------------|----------------------------|
| 1 57. <u>3</u> 89 → _____ | 2 80.4 <u>6</u> 7 → _____ | 3 45.50 <u>2</u> → _____ |
| 4 79. <u>8</u> 85 → _____ | 5 47.0 <u>3</u> 8 → _____ | 6 77.3 <u>8</u> 4 → _____ |
| 7 86.01 <u>4</u> → _____ | 8 36.79 <u>5</u> → _____ | 9 80. <u>1</u> 39 → _____ |
| 10 81. <u>7</u> 60 → _____ | 11 45.6 <u>1</u> 4 → _____ | 12 85.17 <u>7</u> → _____ |
| 13 73.05 <u>6</u> → _____ | 14 49.74 <u>8</u> → _____ | 15 79.5 <u>1</u> 0 → _____ |
| 16 91.09 <u>5</u> → _____ | 17 39. <u>3</u> 07 → _____ | 18 79.9 <u>3</u> 8 → _____ |
| 19 81.7 <u>5</u> 7 → _____ | 20 49. <u>5</u> 88 → _____ | 21 73.3 <u>7</u> 8 → _____ |
| 22 90.8 <u>1</u> 1 → _____ | 23 96. <u>6</u> 58 → _____ | 24 47.53 <u>8</u> → _____ |
| 25 72.78 <u>7</u> → _____ | 26 97. <u>9</u> 81 → _____ | 27 31.05 <u>9</u> → _____ |
| 28 84.0 <u>9</u> 1 → _____ | 29 69.8 <u>7</u> 5 → _____ | 30 42. <u>5</u> 20 → _____ |
| 31 98.1 <u>2</u> 4 → _____ | 32 68.29 <u>9</u> → _____ | 33 34.2 <u>2</u> 2 → _____ |
| 34 94.16 <u>9</u> → _____ | 35 71.94 <u>5</u> → _____ | 36 91. <u>7</u> 14 → _____ |
| 37 65.83 <u>6</u> → _____ | 38 94.3 <u>6</u> 8 → _____ | 39 88.00 <u>9</u> → _____ |
| 40 44. <u>8</u> 03 → _____ | 41 94. <u>3</u> 82 → _____ | 42 91.65 <u>1</u> → _____ |
| 43 34. <u>4</u> 21 → _____ | 44 72. <u>5</u> 44 → _____ | 45 81. <u>3</u> 22 → _____ |
| 46 33. <u>3</u> 90 → _____ | 47 94.9 <u>4</u> 4 → _____ | 48 77. <u>1</u> 40 → _____ |
| 49 82.95 <u>5</u> → _____ | 50 42. <u>6</u> 93 → _____ | |

Comparing Decimals

WORKED EXAMPLE

$$0.8 \boxed{<} 7.5$$

2. Compare decimals

Write $>$, $=$, or $<$ between each pair of decimals.

- | | | | |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| 1 $8.2 \boxed{} 7.21$ | 2 $7.33 \boxed{} 5.59$ | 3 $9.4 \boxed{} 3.01$ | 4 $6.62 \boxed{} 2.81$ |
| 5 $6.2 \boxed{} 1.8$ | 6 $9.09 \boxed{} 7.6$ | 7 $3.43 \boxed{} 8.53$ | 8 $8.5 \boxed{} 6.1$ |
| 9 $9.56 \boxed{} 3.6$ | 10 $4.82 \boxed{} 1.84$ | 11 $9.6 \boxed{} 7.4$ | 12 $2.95 \boxed{} 3.06$ |
| 13 $4.71 \boxed{} 0.74$ | 14 $9.6 \boxed{} 6.2$ | 15 $6.28 \boxed{} 8.56$ | 16 $9.87 \boxed{} 0.47$ |
| 17 $6.2 \boxed{} 4.1$ | 18 $4.33 \boxed{} 7.2$ | 19 $5.83 \boxed{} 1.10$ | 20 $1.26 \boxed{} 9.88$ |
| 21 $3.66 \boxed{} 5.6$ | 22 $4.20 \boxed{} 6.57$ | 23 $4.14 \boxed{} 2.5$ | 24 $0.81 \boxed{} 5.6$ |
| 25 $4.04 \boxed{} 1.81$ | 26 $9.57 \boxed{} 4.9$ | 27 $6.8 \boxed{} 9.2$ | 28 $6.79 \boxed{} 9.8$ |
| 29 $4.83 \boxed{} 7.05$ | 30 $9.5 \boxed{} 8.1$ | 31 $3.81 \boxed{} 3.5$ | 32 $9.80 \boxed{} 3.9$ |
| 33 $2.28 \boxed{} 7.9$ | 34 $9.97 \boxed{} 1.21$ | 35 $6.75 \boxed{} 8.7$ | 36 $9.45 \boxed{} 8.3$ |
| 37 $6.7 \boxed{} 7.95$ | 38 $3.50 \boxed{} 3.15$ | 39 $5.10 \boxed{} 2.0$ | 40 $6.3 \boxed{} 3.44$ |
| 41 $8.96 \boxed{} 8.59$ | 42 $2.68 \boxed{} 4.66$ | 43 $2.39 \boxed{} 6.9$ | 44 $4.40 \boxed{} 0.91$ |
| 45 $4.13 \boxed{} 4.4$ | 46 $6.6 \boxed{} 0.6$ | 47 $5.76 \boxed{} 9.43$ | 48 $8.07 \boxed{} 8.86$ |
| 49 $7.21 \boxed{} 6.05$ | 50 $7.4 \boxed{} 7.40$ | | |

Multiplying and Dividing by 10, 100 and 1000

WORKED EXAMPLE

$$8.5 \times 10 = \underline{85}$$

3. Multiply and divide by 10, 100, 1000

Multiply or divide by moving the decimal point.

1 $6.54 \div 100 = \underline{\hspace{2cm}}$

3 $1.57 \div 100 = \underline{\hspace{2cm}}$

5 $1.6 \times 100 = \underline{\hspace{2cm}}$

7 $8.24 \times 10 = \underline{\hspace{2cm}}$

9 $1.1 \times 1000 = \underline{\hspace{2cm}}$

11 $4.94 \times 100 = \underline{\hspace{2cm}}$

13 $8.64 \times 1000 = \underline{\hspace{2cm}}$

15 $7.46 \div 100 = \underline{\hspace{2cm}}$

17 $3.68 \div 10 = \underline{\hspace{2cm}}$

19 $8.27 \times 1000 = \underline{\hspace{2cm}}$

21 $9.68 \div 10 = \underline{\hspace{2cm}}$

23 $7.06 \times 10 = \underline{\hspace{2cm}}$

25 $7.64 \times 100 = \underline{\hspace{2cm}}$

27 $4.44 \div 10 = \underline{\hspace{2cm}}$

29 $9.73 \div 1000 = \underline{\hspace{2cm}}$

31 $8.39 \times 10 = \underline{\hspace{2cm}}$

33 $4.22 \div 1000 = \underline{\hspace{2cm}}$

35 $8.35 \times 10 = \underline{\hspace{2cm}}$

37 $1.75 \div 10 = \underline{\hspace{2cm}}$

39 $8.23 \times 1000 = \underline{\hspace{2cm}}$

41 $7.02 \div 100 = \underline{\hspace{2cm}}$

43 $2.16 \div 1000 = \underline{\hspace{2cm}}$

45 $8.9 \times 1000 = \underline{\hspace{2cm}}$

47 $3.2 \times 1000 = \underline{\hspace{2cm}}$

49 $4.8 \times 1000 = \underline{\hspace{2cm}}$

2 $7.87 \times 10 = \underline{\hspace{2cm}}$

4 $3.76 \times 1000 = \underline{\hspace{2cm}}$

6 $7.78 \times 100 = \underline{\hspace{2cm}}$

8 $2.43 \div 10 = \underline{\hspace{2cm}}$

10 $7.36 \times 100 = \underline{\hspace{2cm}}$

12 $2.6 \times 1000 = \underline{\hspace{2cm}}$

14 $1.89 \div 10 = \underline{\hspace{2cm}}$

16 $8.47 \times 10 = \underline{\hspace{2cm}}$

18 $9.28 \div 1000 = \underline{\hspace{2cm}}$

20 $9.8 \times 10 = \underline{\hspace{2cm}}$

22 $7.9 \times 100 = \underline{\hspace{2cm}}$

24 $4.8 \times 100 = \underline{\hspace{2cm}}$

26 $8.51 \times 1000 = \underline{\hspace{2cm}}$

28 $8.85 \times 1000 = \underline{\hspace{2cm}}$

30 $1.3 \times 100 = \underline{\hspace{2cm}}$

32 $1.75 \times 1000 = \underline{\hspace{2cm}}$

34 $4.76 \times 1000 = \underline{\hspace{2cm}}$

36 $8.14 \div 1000 = \underline{\hspace{2cm}}$

38 $6.08 \times 1000 = \underline{\hspace{2cm}}$

40 $4.06 \times 10 = \underline{\hspace{2cm}}$

42 $6.5 \times 1000 = \underline{\hspace{2cm}}$

44 $7.73 \times 10 = \underline{\hspace{2cm}}$

46 $2.57 \div 1000 = \underline{\hspace{2cm}}$

48 $9.4 \times 100 = \underline{\hspace{2cm}}$

50 $4.25 \div 10 = \underline{\hspace{2cm}}$

Adding and Subtracting Decimals

WORKED EXAMPLE

$$\begin{array}{r}
 0.14 \\
 \cancel{14.13} \\
 - 9.01 \\
 \hline
 5.12
 \end{array}$$

4. Add and subtract decimals

Add or subtract the decimals.

$$\begin{array}{r}
 1 \quad 3.24 \\
 + 6.02 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 2 \quad 3.08 \\
 + 18.49 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 3 \quad 9.02 \\
 + 6.64 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 4 \quad 17.52 \\
 + 1.17 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 5 \quad 1.92 \\
 + 7.76 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 6 \quad 15.05 \\
 + 3.60 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 7 \quad 17.52 \\
 + 5.57 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 8 \quad 6.95 \\
 + 8.11 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 9 \quad 10.32 \\
 + 15.80 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 10 \quad 13.60 \\
 + 12.04 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 11 \quad 9.48 \\
 + 7.06 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 12 \quad 19.51 \\
 + 5.93 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 13 \quad 16.81 \\
 + 13.52 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 14 \quad 10.00 \\
 - 0.02 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 15 \quad 19.49 \\
 + 3.77 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 16 \quad 15.93 \\
 + 15.05 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 17 \quad 14.48 \\
 - 5.00 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 18 \quad 15.36 \\
 + 5.16 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 19 \quad 12.28 \\
 + 11.97 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 20 \quad 8.17 \\
 + 4.76 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 21 \quad 19.65 \\
 + 12.63 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 22 \quad 4.27 \\
 + 16.29 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 23 \quad 17.13 \\
 + 14.42 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 24 \quad 8.66 \\
 + 3.34 \\
 \hline
 \end{array}$$

5. What the digit is worth

Write the value of the highlighted digit.

25 61.326 → _____

26 86.621 → _____

27 33.618 → _____

28 81.322 → _____

29 50.215 → _____

30 83.260 → _____

31 82.955 → _____

32 49.748 → _____

33 78.061 → _____

34 99.523 → _____

Multiplying Decimals

WORKED EXAMPLE

$$7.1 \times 11 = \underline{78.1}$$

6. Multiply and divide decimals

Multiply the decimals.

- | | | |
|-------------------------------|-------------------------------|-------------------------------|
| 1 $9.30 \times 9 =$ _____ | 2 $7.79 \times 8.8 =$ _____ | 3 $10.36 \times 12 =$ _____ |
| 4 $2.61 \times 2.77 =$ _____ | 5 $6.84 \times 1.5 =$ _____ | 6 $8.91 \times 2.91 =$ _____ |
| 7 $7.8 \times 5.08 =$ _____ | 8 $0.77 \times 8.0 =$ _____ | 9 $8.6 \times 2.24 =$ _____ |
| 10 $6.8 \times 7.04 =$ _____ | 11 $8.35 \times 11 =$ _____ | 12 $6.8 \times 3.34 =$ _____ |
| 13 $3.1 \times 8.66 =$ _____ | 14 $7.98 \times 2.0 =$ _____ | 15 $7.1 \times 6.37 =$ _____ |
| 16 $5.26 \times 2.24 =$ _____ | 17 $7.0 \times 9.0 =$ _____ | 18 $7.96 \times 2.07 =$ _____ |
| 19 $6.11 \times 5.3 =$ _____ | 20 $4.5 \times 4.8 =$ _____ | 21 $7.7 \times 7.96 =$ _____ |
| 22 $6.3 \times 7.97 =$ _____ | 23 $0.47 \times 3.92 =$ _____ | 24 $6.67 \times 5 =$ _____ |
| 25 $1.63 \times 4.76 =$ _____ | 26 $6.06 \times 3.6 =$ _____ | 27 $2.09 \times 1.2 =$ _____ |
| 28 $8.22 \times 6.11 =$ _____ | 29 $3.15 \times 3.06 =$ _____ | 30 $1.18 \times 2.7 =$ _____ |
| 31 $7.43 \times 5.57 =$ _____ | 32 $2.87 \times 4.91 =$ _____ | 33 $3.06 \times 0.51 =$ _____ |
| 34 $2.90 \times 3.42 =$ _____ | 35 $6.88 \times 4.1 =$ _____ | 36 $3.63 \times 1.82 =$ _____ |
| 37 $7.44 \times 3 =$ _____ | 38 $5.33 \times 7.59 =$ _____ | 39 $5.6 \times 6.67 =$ _____ |
| 40 $4.2 \times 1.71 =$ _____ | 41 $7.65 \times 2.49 =$ _____ | 42 $7.7 \times 8.55 =$ _____ |
| 43 $9.0 \times 1.67 =$ _____ | 44 $8.13 \times 1.23 =$ _____ | |

7. Compare decimals

Write $>$, $=$, or $<$ between each pair of decimals.

- | | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 45 1.15 <input type="text"/> 7.92 | 46 8.25 <input type="text"/> 9.96 | 47 0.61 <input type="text"/> 6.0 | 48 3.12 <input type="text"/> 5.71 |
| 49 7.6 <input type="text"/> 7.2 | 50 5.21 <input type="text"/> 5.4 | 51 8.09 <input type="text"/> 9.96 | 52 8.2 <input type="text"/> 4.74 |
| 53 3.88 <input type="text"/> 2.08 | 54 2.95 <input type="text"/> 3.06 | | |

Multiplying Three Digits by Two

WORKED EXAMPLE

$$\begin{array}{r}
 216 \\
 \times 32 \\
 \hline
 432 \\
 6480 \\
 \hline
 6912
 \end{array}$$

8. Multiply multi-digit numbers

Multiply. Show your working.

$$\begin{array}{r}
 1 \quad 240 \\
 \times 98 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 2 \quad 933 \\
 \times 75 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 3 \quad 451 \\
 \times 41 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 4 \quad 664 \\
 \times 61 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 5 \quad 258 \\
 \times 82 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 6 \quad 879 \\
 \times 68 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 7 \quad 787 \\
 \times 74 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 8 \quad 321 \\
 \times 69 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 9 \quad 952 \\
 \times 59 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 10 \quad 519 \\
 \times 86 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 11 \quad 392 \\
 \times 55 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 12 \quad 638 \\
 \times 95 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 13 \quad 693 \\
 \times 76 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 14 \quad 483 \\
 \times 61 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 15 \quad 921 \\
 \times 54 \\
 \hline
 \end{array}$$

8. Multiply multi-digit numbers (continued)

Multiply. Show your working.

$$\begin{array}{r} 16 \quad 898 \\ \times \quad 53 \\ \hline \end{array}$$

9. Multiply and divide by 10, 100, 1000

Multiply or divide by moving the decimal point.

- | | | | | | |
|----|---|----|---|----|--|
| 17 | $1.3 \times 100 = \underline{\hspace{2cm}}$ | 18 | $9.34 \div 100 = \underline{\hspace{2cm}}$ | 19 | $4.9 \times 100 = \underline{\hspace{2cm}}$ |
| 20 | $4.76 \times 1000 = \underline{\hspace{2cm}}$ | 21 | $3.84 \div 10 = \underline{\hspace{2cm}}$ | 22 | $3.2 \times 1000 = \underline{\hspace{2cm}}$ |
| 23 | $7.06 \times 10 = \underline{\hspace{2cm}}$ | 24 | $0.43 \times 1000 = \underline{\hspace{2cm}}$ | 25 | $7.1 \times 100 = \underline{\hspace{2cm}}$ |
| 26 | $7.73 \times 10 = \underline{\hspace{2cm}}$ | | | | |

Long Division

WORKED EXAMPLE

$$\begin{array}{r} 30 \\ 67 \overline{)2010} \\ \underline{201} \\ 0 \end{array}$$

10. Long division

Divide. Show your working.

1

$$52 \overline{)4628}$$

2

$$40 \overline{)9120}$$

3

$$25 \overline{)5875}$$

4

$$42 \overline{)8568}$$

5

$$28 \overline{)6888}$$

6

$$72 \overline{)8856}$$

7

$$15 \overline{)9555}$$

8

$$96 \overline{)5952}$$

9

$$52 \overline{)8944}$$

10

$$13 \overline{)7306}$$

11. Add and subtract decimals

Add or subtract the decimals.

$$\begin{array}{r} 11 \quad 16.67 \\ - 0.02 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \quad 14.11 \\ + 18.26 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \quad 14.75 \\ - 4.69 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \quad 16.24 \\ + 19.47 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \quad 5.46 \\ + 6.89 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \quad 15.93 \\ + 15.05 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \quad 9.64 \\ + 17.30 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \quad 4.96 \\ + 9.30 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \quad 7.62 \\ + 18.80 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \quad 14.37 \\ + 19.99 \\ \hline \end{array}$$

Long Division with Remainders

WORKED EXAMPLE

$$\begin{array}{r} 40 \\ 26 \overline{)1064} \\ \underline{104} \\ 24 \end{array}$$

12. Long division with remainders

Divide. Give the quotient and the remainder.

$$\begin{array}{l} 1 \quad \quad \quad _ R _ \quad 2 \\ 65 \overline{)5639} \end{array} \quad \begin{array}{l} _ R _ \quad 3 \\ 66 \overline{)9554} \end{array} \quad \begin{array}{l} _ R _ \quad 4 \\ 83 \overline{)6795} \end{array} \quad \begin{array}{l} _ R _ \quad 5 \\ 28 \overline{)9570} \end{array} \quad \begin{array}{l} _ R _ \\ 37 \overline{)4456} \end{array}$$

$$\begin{array}{l} 6 \quad \quad \quad _ R _ \quad 7 \\ 35 \overline{)7083} \end{array} \quad \begin{array}{l} _ R _ \quad 8 \\ 43 \overline{)7622} \end{array} \quad \begin{array}{l} _ R _ \quad 9 \\ 41 \overline{)5893} \end{array} \quad \begin{array}{l} _ R _ \quad 10 \\ 79 \overline{)8493} \end{array} \quad \begin{array}{l} _ R _ \\ 18 \overline{)9316} \end{array}$$

13. Multiply and divide decimals

Multiply the decimals.

$$\begin{array}{lll} 11 & 7.48 \times 12 = \underline{\hspace{2cm}} & 12 & 2.56 \times 4.95 = \underline{\hspace{2cm}} & 13 & 0.37 \times 5.6 = \underline{\hspace{2cm}} \\ 14 & 5.6 \times 8.69 = \underline{\hspace{2cm}} & 15 & 10.36 \times 12 = \underline{\hspace{2cm}} & 16 & 8.22 \times 6.11 = \underline{\hspace{2cm}} \\ 17 & 7.4 \times 7.87 = \underline{\hspace{2cm}} & 18 & 0.26 \times 4.53 = \underline{\hspace{2cm}} & 19 & 8.6 \times 2.24 = \underline{\hspace{2cm}} \\ 20 & 6.2 \times 6.21 = \underline{\hspace{2cm}} & & & & \end{array}$$

Equivalent Fractions

14. Equivalent fractions

Write the missing number that makes the fractions equal.

$$1 \quad \frac{1}{2} = \frac{\quad}{8}$$

$$2 \quad \frac{1}{4} = \frac{\quad}{8}$$

$$3 \quad \frac{1}{2} = \frac{\quad}{4}$$

$$4 \quad \frac{3}{4} = \frac{\quad}{8}$$

$$5 \quad \frac{1}{3} = \frac{\quad}{6}$$

$$6 \quad \frac{2}{3} = \frac{\quad}{6}$$

$$7 \quad \frac{1}{2} = \frac{\quad}{6}$$

15. Simplifying fractions

Write each fraction in simplest form.

$$8 \quad \frac{6}{8} = \frac{\quad}{\quad}$$

$$9 \quad \frac{4}{8} = \frac{\quad}{\quad}$$

$$10 \quad \frac{2}{6} = \frac{\quad}{\quad}$$

$$11 \quad \frac{2}{8} = \frac{\quad}{\quad}$$

$$12 \quad \frac{3}{6} = \frac{\quad}{\quad}$$

$$13 \quad \frac{4}{6} = \frac{\quad}{\quad}$$

$$14 \quad \frac{2}{4} = \frac{\quad}{\quad}$$

16. Multiply multi-digit numbers

Multiply. Show your working.

$$15 \quad \begin{array}{r} 298 \\ \times 82 \\ \hline \end{array}$$

$$16 \quad \begin{array}{r} 682 \\ \times 69 \\ \hline \end{array}$$

$$17 \quad \begin{array}{r} 354 \\ \times 52 \\ \hline \end{array}$$

$$18 \quad \begin{array}{r} 886 \\ \times 62 \\ \hline \end{array}$$

$$19 \quad \begin{array}{r} 637 \\ \times 30 \\ \hline \end{array}$$

$$20 \quad \begin{array}{r} 784 \\ \times 99 \\ \hline \end{array}$$

$$21 \quad \begin{array}{r} 960 \\ \times 85 \\ \hline \end{array}$$

$$22 \quad \begin{array}{r} 449 \\ \times 45 \\ \hline \end{array}$$

Multiplying Fractions

WORKED EXAMPLE

$$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

17. Multiplying fractions

Multiply. Write each answer in simplest form.

1 $\frac{1}{8} \times \frac{1}{3} = \text{—}$

2 $\frac{1}{3} \times \frac{4}{7} = \text{—}$

3 $\frac{2}{4} \times \frac{1}{8} = \text{—}$

4 $\frac{1}{6} \times \frac{1}{4} = \text{—}$

5 $\frac{1}{8} \times \frac{4}{6} = \text{—}$

6 $\frac{3}{5} \times \frac{1}{3} = \text{—}$

7 $\frac{2}{4} \times \frac{4}{6} = \text{—}$

8 $\frac{4}{6} \times \frac{1}{2} = \text{—}$

9 $\frac{3}{8} \times \frac{4}{7} = \text{—}$

10 $\frac{3}{6} \times \frac{3}{6} = \text{—}$

11 $\frac{1}{7} \times \frac{6}{8} = \text{—}$

12 $\frac{1}{6} \times \frac{3}{4} = \text{—}$

13 $\frac{3}{8} \times \frac{3}{4} = \text{—}$

14 $\frac{1}{4} \times \frac{2}{4} = \text{—}$

15 $\frac{6}{7} \times \frac{3}{6} = \text{—}$

16 $\frac{2}{3} \times \frac{3}{5} = \text{—}$

17 $\frac{2}{4} \times \frac{7}{8} = \text{—}$

18 $\frac{2}{3} \times \frac{5}{7} = \text{—}$

19 $\frac{4}{8} \times \frac{3}{8} = \text{—}$

20 $\frac{5}{7} \times \frac{6}{8} = \text{—}$

21 $\frac{1}{8} \times \frac{1}{8} = \text{—}$

22 $\frac{3}{8} \times \frac{1}{6} = \text{—}$

23 $\frac{2}{5} \times \frac{3}{8} = \text{—}$

24 $\frac{3}{8} \times \frac{1}{4} = \text{—}$

18. Word problems: fractions

Read each problem. Write the answer.

- 25 Suki used $\frac{6}{12}$ kilogram of hay in the morning, and Courtney used $\frac{5}{12}$ kilogram later on.

How much more did Suki use than Courtney?

- 26 Maya added some to $\frac{5}{8}$ liter of water and ended up with $\frac{6}{8}$ liter.

How much did Maya add?

- 27 Between them, Elena used $\frac{7}{8}$ liter of paint and Jordan used $\frac{5}{8}$ liter.

How much did they use altogether?

Mixed Numbers

WORKED EXAMPLE

$$2\frac{2}{5} + 5\frac{2}{5} = 7\frac{4}{5}$$

19. Adding mixed numbers

Add. Write each answer as a mixed number in simplest form.

1 $2\frac{3}{7} + 4\frac{4}{7} = \underline{\hspace{1cm}}$

4 $5\frac{4}{5} + 1\frac{2}{5} = \underline{\hspace{1cm}}$

7 $5\frac{1}{8} + 3\frac{1}{8} = \underline{\hspace{1cm}}$

10 $1\frac{1}{3} + 4\frac{1}{3} = \underline{\hspace{1cm}}$

13 $1\frac{2}{7} + 5\frac{2}{7} = \underline{\hspace{1cm}}$

16 $5\frac{2}{5} + 2\frac{4}{5} = \underline{\hspace{1cm}}$

19 $2\frac{6}{7} + 2\frac{3}{7} = \underline{\hspace{1cm}}$

22 $4\frac{3}{7} + 5\frac{5}{7} = \underline{\hspace{1cm}}$

25 $4\frac{4}{5} + 5\frac{2}{5} = \underline{\hspace{1cm}}$

28 $3\frac{5}{8} + 5\frac{5}{8} = \underline{\hspace{1cm}}$

31 $1\frac{7}{8} + 4\frac{3}{8} = \underline{\hspace{1cm}}$

34 $2\frac{7}{8} + 3\frac{7}{8} = \underline{\hspace{1cm}}$

37 $5\frac{1}{6} + 4\frac{5}{6} = \underline{\hspace{1cm}}$

40 $3\frac{4}{7} + 2\frac{3}{7} = \underline{\hspace{1cm}}$

43 $2\frac{6}{7} + 1\frac{5}{7} = \underline{\hspace{1cm}}$

2 $2\frac{4}{7} + 1\frac{4}{7} = \underline{\hspace{1cm}}$

5 $3\frac{5}{6} + 3\frac{5}{6} = \underline{\hspace{1cm}}$

8 $1\frac{4}{5} + 1\frac{2}{5} = \underline{\hspace{1cm}}$

11 $3\frac{3}{5} + 2\frac{2}{5} = \underline{\hspace{1cm}}$

14 $5\frac{6}{7} + 5\frac{5}{7} = \underline{\hspace{1cm}}$

17 $5\frac{6}{7} + 1\frac{2}{7} = \underline{\hspace{1cm}}$

20 $2\frac{5}{6} + 1\frac{1}{6} = \underline{\hspace{1cm}}$

23 $2\frac{3}{4} + 5\frac{3}{4} = \underline{\hspace{1cm}}$

26 $2\frac{4}{5} + 1\frac{2}{5} = \underline{\hspace{1cm}}$

29 $5\frac{6}{7} + 4\frac{5}{7} = \underline{\hspace{1cm}}$

32 $5\frac{5}{7} + 3\frac{4}{7} = \underline{\hspace{1cm}}$

35 $2\frac{5}{7} + 1\frac{6}{7} = \underline{\hspace{1cm}}$

38 $5\frac{1}{5} + 1\frac{4}{5} = \underline{\hspace{1cm}}$

41 $5\frac{3}{5} + 5\frac{1}{5} = \underline{\hspace{1cm}}$

3 $2\frac{3}{8} + 3\frac{1}{8} = \underline{\hspace{1cm}}$

6 $5\frac{5}{6} + 5\frac{5}{6} = \underline{\hspace{1cm}}$

9 $3\frac{6}{7} + 4\frac{1}{7} = \underline{\hspace{1cm}}$

12 $5\frac{7}{8} + 5\frac{3}{8} = \underline{\hspace{1cm}}$

15 $3\frac{2}{7} + 1\frac{4}{7} = \underline{\hspace{1cm}}$

18 $2\frac{3}{5} + 1\frac{1}{5} = \underline{\hspace{1cm}}$

21 $5\frac{2}{5} + 2\frac{1}{5} = \underline{\hspace{1cm}}$

24 $5\frac{3}{8} + 1\frac{1}{8} = \underline{\hspace{1cm}}$

27 $5\frac{1}{7} + 2\frac{4}{7} = \underline{\hspace{1cm}}$

30 $1\frac{5}{8} + 2\frac{1}{8} = \underline{\hspace{1cm}}$

33 $4\frac{1}{4} + 4\frac{1}{4} = \underline{\hspace{1cm}}$

36 $4\frac{1}{7} + 3\frac{4}{7} = \underline{\hspace{1cm}}$

39 $1\frac{4}{7} + 5\frac{1}{7} = \underline{\hspace{1cm}}$

42 $1\frac{2}{7} + 2\frac{6}{7} = \underline{\hspace{1cm}}$

20. Long division

Divide. Show your working.

44

$$86 \overline{) 6880}$$

45

$$69 \overline{) 7521}$$

46

$$97 \overline{) 6111}$$

47

$$56 \overline{) 7840}$$

48

$$94 \overline{) 4042}$$

49

$$83 \overline{) 7553}$$

50

$$42 \overline{) 8988}$$

51

$$51 \overline{) 4182}$$

Decimals as Fractions

21. Decimals as fractions

Write each decimal as a fraction in simplest form.

$$1 \quad 0.375 \rightarrow \text{—}$$

$$2 \quad 0.625 \rightarrow \text{—}$$

$$3 \quad 0.75 \rightarrow \text{—}$$

$$4 \quad 0.125 \rightarrow \text{—}$$

$$5 \quad 0.875 \rightarrow \text{—}$$

$$6 \quad 0.6 \rightarrow \text{—}$$

$$7 \quad 0.25 \rightarrow \text{—}$$

$$8 \quad 0.2 \rightarrow \text{—}$$

$$9 \quad 0.8 \rightarrow \text{—}$$

$$10 \quad 0.5 \rightarrow \text{—}$$

$$11 \quad 0.4 \rightarrow \text{—}$$

22. Simplifying fractions

Write each fraction in simplest form.

$$12 \quad \frac{2}{8} = \text{—}$$

$$13 \quad \frac{6}{8} = \text{—}$$

$$14 \quad \frac{3}{6} = \text{—}$$

$$15 \quad \frac{4}{8} = \text{—}$$

$$16 \quad \frac{2}{4} = \text{—}$$

$$17 \quad \frac{2}{6} = \text{—}$$

$$18 \quad \frac{4}{6} = \text{—}$$

Adding Unlike Fractions

WORKED EXAMPLE

$$\frac{3}{5} + \frac{4}{6} = \frac{19}{15}$$

23. Add and subtract fractions

Add or subtract. Write each answer in simplest form.

1 $\frac{2}{4} - \frac{1}{3} = \text{—}$

4 $\frac{2}{3} - \frac{3}{5} = \text{—}$

7 $\frac{2}{7} - \frac{2}{8} = \text{—}$

10 $\frac{4}{5} - \frac{3}{7} = \text{—}$

13 $\frac{4}{7} - \frac{1}{3} = \text{—}$

16 $\frac{1}{3} - \frac{1}{4} = \text{—}$

19 $\frac{5}{7} + \frac{6}{8} = \text{—}$

22 $\frac{2}{5} - \frac{1}{8} = \text{—}$

25 $\frac{3}{5} + \frac{2}{4} = \text{—}$

28 $\frac{2}{3} - \frac{2}{6} = \text{—}$

31 $\frac{2}{3} - \frac{5}{8} = \text{—}$

34 $\frac{4}{8} - \frac{3}{7} = \text{—}$

37 $\frac{6}{7} - \frac{6}{8} = \text{—}$

40 $\frac{6}{7} - \frac{2}{3} = \text{—}$

43 $\frac{7}{8} - \frac{3}{6} = \text{—}$

2 $\frac{4}{5} + \frac{6}{7} = \text{—}$

5 $\frac{3}{8} - \frac{1}{7} = \text{—}$

8 $\frac{6}{8} - \frac{2}{3} = \text{—}$

11 $\frac{4}{7} - \frac{3}{6} = \text{—}$

14 $\frac{5}{7} - \frac{2}{8} = \text{—}$

17 $\frac{2}{4} - \frac{1}{8} = \text{—}$

20 $\frac{7}{8} - \frac{5}{6} = \text{—}$

23 $\frac{3}{8} - \frac{1}{4} = \text{—}$

26 $\frac{3}{5} - \frac{4}{8} = \text{—}$

29 $\frac{6}{8} - \frac{5}{7} = \text{—}$

32 $\frac{4}{7} + \frac{3}{8} = \text{—}$

35 $\frac{5}{6} - \frac{5}{7} = \text{—}$

38 $\frac{1}{4} + \frac{5}{7} = \text{—}$

41 $\frac{4}{7} - \frac{1}{2} = \text{—}$

3 $\frac{3}{7} - \frac{1}{8} = \text{—}$

6 $\frac{4}{7} + \frac{4}{5} = \text{—}$

9 $\frac{6}{7} - \frac{4}{5} = \text{—}$

12 $\frac{1}{6} + \frac{5}{7} = \text{—}$

15 $\frac{5}{7} - \frac{1}{3} = \text{—}$

18 $\frac{3}{4} - \frac{2}{5} = \text{—}$

21 $\frac{3}{6} - \frac{1}{4} = \text{—}$

24 $\frac{2}{5} - \frac{1}{4} = \text{—}$

27 $\frac{1}{2} - \frac{3}{8} = \text{—}$

30 $\frac{5}{8} - \frac{1}{4} = \text{—}$

33 $\frac{4}{5} - \frac{2}{3} = \text{—}$

36 $\frac{4}{6} - \frac{1}{2} = \text{—}$

39 $\frac{5}{6} - \frac{5}{8} = \text{—}$

42 $\frac{6}{8} - \frac{3}{6} = \text{—}$

24. Long division with remainders

Divide. Give the quotient and the remainder.

$$\begin{array}{r} \text{44} \qquad \quad _ \text{ R } _ \text{45} \\ 62 \overline{) 5848} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{46} \\ 91 \overline{) 7903} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{47} \\ 38 \overline{) 4427} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{48} \\ 62 \overline{) 7074} \end{array} \quad \begin{array}{r} _ \text{ R } _ \\ 67 \overline{) 6858} \end{array}$$

$$\begin{array}{r} \text{49} \qquad \quad _ \text{ R } _ \text{50} \\ 76 \overline{) 7911} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{51} \\ 19 \overline{) 7658} \end{array} \quad \begin{array}{r} _ \text{ R } _ \\ 78 \overline{) 6482} \end{array}$$

Comparing Fractions

WORKED EXAMPLE

$$\frac{3}{7} < \frac{4}{8}$$

25. Comparing fractions

Write $>$, $=$, or $<$ between each pair of fractions.

- | | | | | |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1 $\frac{1}{6} \bigcirc \frac{3}{4}$ | 2 $\frac{1}{5} \bigcirc \frac{3}{6}$ | 3 $\frac{2}{4} \bigcirc \frac{1}{4}$ | 4 $\frac{3}{5} \bigcirc \frac{2}{5}$ | 5 $\frac{1}{2} \bigcirc \frac{2}{5}$ |
| 6 $\frac{4}{5} \bigcirc \frac{1}{2}$ | 7 $\frac{2}{8} \bigcirc \frac{1}{7}$ | 8 $\frac{2}{5} \bigcirc \frac{4}{8}$ | 9 $\frac{3}{5} \bigcirc \frac{3}{6}$ | 10 $\frac{2}{6} \bigcirc \frac{1}{4}$ |
| 11 $\frac{3}{5} \bigcirc \frac{3}{5}$ | 12 $\frac{1}{6} \bigcirc \frac{4}{7}$ | 13 $\frac{6}{8} \bigcirc \frac{1}{2}$ | 14 $\frac{1}{5} \bigcirc \frac{2}{8}$ | 15 $\frac{4}{5} \bigcirc \frac{2}{5}$ |
| 16 $\frac{1}{4} \bigcirc \frac{2}{8}$ | 17 $\frac{2}{7} \bigcirc \frac{2}{7}$ | 18 $\frac{2}{6} \bigcirc \frac{2}{3}$ | 19 $\frac{3}{4} \bigcirc \frac{6}{7}$ | 20 $\frac{3}{8} \bigcirc \frac{2}{4}$ |
| 21 $\frac{2}{4} \bigcirc \frac{2}{3}$ | 22 $\frac{2}{5} \bigcirc \frac{2}{6}$ | 23 $\frac{1}{2} \bigcirc \frac{7}{8}$ | 24 $\frac{4}{6} \bigcirc \frac{7}{8}$ | 25 $\frac{5}{7} \bigcirc \frac{2}{5}$ |
| 26 $\frac{6}{7} \bigcirc \frac{5}{8}$ | 27 $\frac{5}{8} \bigcirc \frac{1}{5}$ | 28 $\frac{5}{6} \bigcirc \frac{6}{7}$ | 29 $\frac{3}{4} \bigcirc \frac{5}{8}$ | 30 $\frac{2}{3} \bigcirc \frac{2}{6}$ |
| 31 $\frac{3}{4} \bigcirc \frac{4}{5}$ | 32 $\frac{3}{5} \bigcirc \frac{7}{8}$ | 33 $\frac{7}{8} \bigcirc \frac{4}{7}$ | 34 $\frac{2}{7} \bigcirc \frac{1}{7}$ | 35 $\frac{5}{8} \bigcirc \frac{4}{8}$ |
| 36 $\frac{1}{8} \bigcirc \frac{2}{8}$ | 37 $\frac{1}{3} \bigcirc \frac{6}{8}$ | 38 $\frac{2}{4} \bigcirc \frac{4}{6}$ | 39 $\frac{7}{8} \bigcirc \frac{3}{8}$ | 40 $\frac{1}{3} \bigcirc \frac{2}{8}$ |
| 41 $\frac{3}{4} \bigcirc \frac{2}{5}$ | 42 $\frac{3}{7} \bigcirc \frac{2}{4}$ | 43 $\frac{5}{6} \bigcirc \frac{4}{7}$ | 44 $\frac{6}{7} \bigcirc \frac{1}{6}$ | 45 $\frac{6}{8} \bigcirc \frac{2}{6}$ |
| 46 $\frac{4}{8} \bigcirc \frac{3}{7}$ | 47 $\frac{2}{4} \bigcirc \frac{4}{5}$ | 48 $\frac{3}{7} \bigcirc \frac{1}{6}$ | 49 $\frac{3}{4} \bigcirc \frac{4}{7}$ | 50 $\frac{1}{6} \bigcirc \frac{2}{7}$ |

26. Multiplying fractions

Multiply. Write each answer in simplest form.

- | | | |
|--|--|--|
| 51 $\frac{4}{7} \times \frac{3}{8} = \text{—}$ | 52 $\frac{1}{6} \times \frac{7}{8} = \text{—}$ | 53 $\frac{1}{8} \times \frac{4}{6} = \text{—}$ |
| 54 $\frac{1}{6} \times \frac{2}{8} = \text{—}$ | 55 $\frac{1}{3} \times \frac{1}{4} = \text{—}$ | 56 $\frac{2}{8} \times \frac{4}{7} = \text{—}$ |
| 57 $\frac{3}{7} \times \frac{6}{7} = \text{—}$ | 58 $\frac{3}{4} \times \frac{2}{6} = \text{—}$ | 59 $\frac{1}{4} \times \frac{5}{6} = \text{—}$ |
| 60 $\frac{3}{4} \times \frac{7}{8} = \text{—}$ | | |

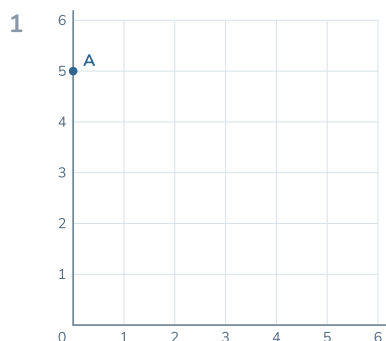
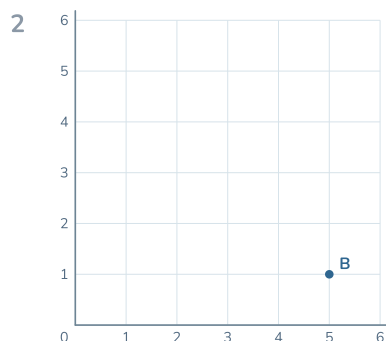
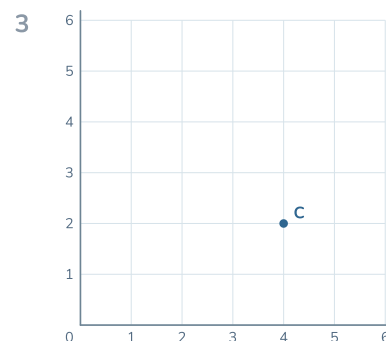
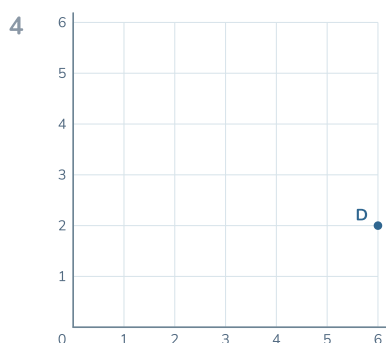
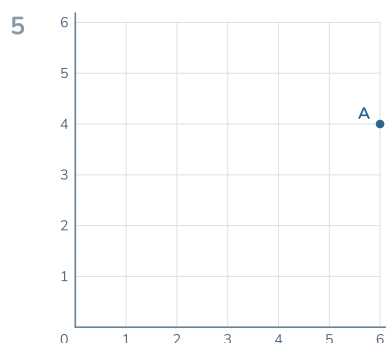
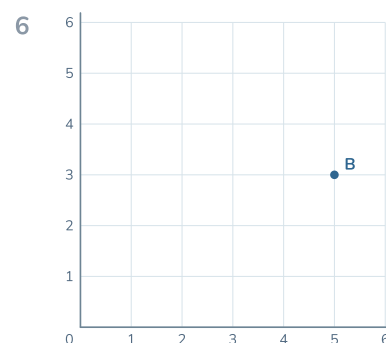
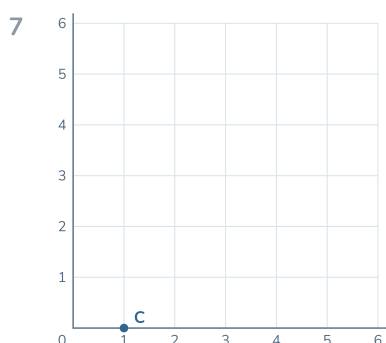
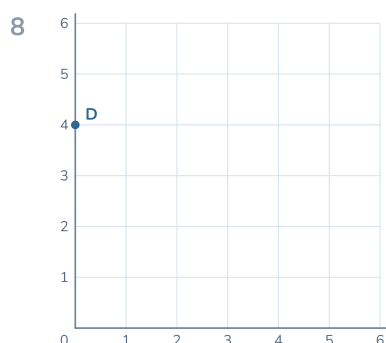
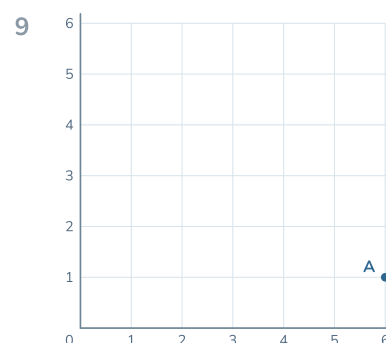
The Coordinate Plane

WORKED EXAMPLE

$A = (5, 2)$

27. Points on a coordinate grid

Write the ordered pair for each marked point.

 $A = \underline{\hspace{2cm}}$  $B = \underline{\hspace{2cm}}$  $C = \underline{\hspace{2cm}}$  $D = \underline{\hspace{2cm}}$  $A = \underline{\hspace{2cm}}$  $B = \underline{\hspace{2cm}}$  $C = \underline{\hspace{2cm}}$  $D = \underline{\hspace{2cm}}$  $A = \underline{\hspace{2cm}}$

28. Adding mixed numbers

Add. Write each answer as a mixed number in simplest form.

$$10 \quad 4\frac{6}{7} + 3\frac{3}{7} = \underline{\quad} \text{ —}$$

$$11 \quad 3\frac{3}{5} + 2\frac{2}{5} = \underline{\quad} \text{ —}$$

$$12 \quad 1\frac{5}{8} + 2\frac{1}{8} = \underline{\quad} \text{ —}$$

$$13 \quad 5\frac{4}{5} + 1\frac{2}{5} = \underline{\quad} \text{ —}$$

$$14 \quad 4\frac{3}{4} + 5\frac{3}{4} = \underline{\quad} \text{ —}$$

$$15 \quad 2\frac{5}{8} + 4\frac{5}{8} = \underline{\quad} \text{ —}$$

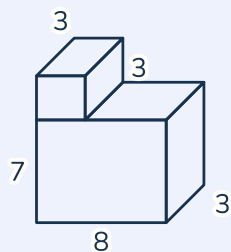
$$16 \quad 5\frac{1}{7} + 2\frac{5}{7} = \underline{\quad} \text{ —}$$

$$17 \quad 4\frac{2}{7} + 4\frac{5}{7} = \underline{\quad} \text{ —}$$

$$18 \quad 3\frac{4}{7} + 2\frac{4}{7} = \underline{\quad} \text{ —}$$

Volume of Prisms

WORKED EXAMPLE

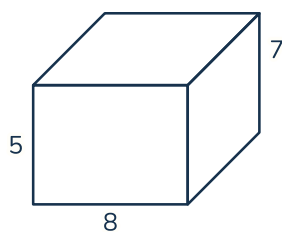


195 cm³

29. Volume of a rectangular prism

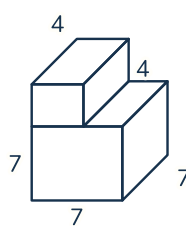
Find the volume of each box. All lengths are in centimeters.

1



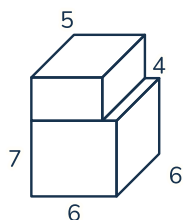
_____ cm³

2



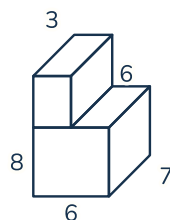
_____ cm³

3



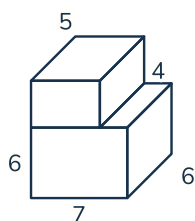
_____ cm³

4



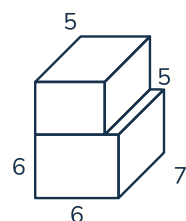
_____ cm³

5



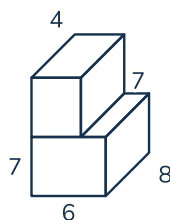
_____ cm³

6



_____ cm³

7



_____ cm³

30. Decimals as fractions

Write each decimal as a fraction in simplest form.

⁸ 0.375 → —

⁹ 0.125 → —

¹⁰ 0.4 → —

¹¹ 0.625 → —

¹² 0.875 → —

¹³ 0.8 → —

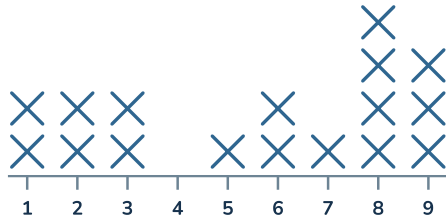
¹⁴ 0.75 → —

Line Plots

31. Line plots

Read each line plot and answer the question.

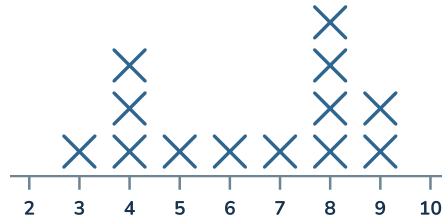
Length of the feathers (inches)



- 1 How many more feathers measured 8 inches than 1 inch?

—

Length of the craft sticks (inches)



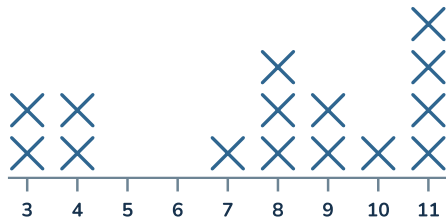
- 2 How many sticks were measured altogether?

—

- 3 How many sticks were longer than 4 inches?

—

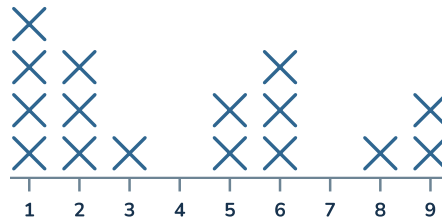
Height of the bean plants (inches)



- 4 How many more plants measured 4 inches than 10 inches?

—

Length of ribbon pieces (inches)



- 6 How many pieces measured 1 inch?

—

- 5 How many more plants measured 8 inches than 4 inches?

—

32. Comparing fractions

Write $>$, $=$, or $<$ between each pair of fractions.

- 7 $\frac{3}{8} \bigcirc \frac{2}{5}$ 8 $\frac{4}{5} \bigcirc \frac{5}{6}$ 9 $\frac{2}{5} \bigcirc \frac{1}{4}$ 10 $\frac{2}{4} \bigcirc \frac{2}{7}$ 11 $\frac{1}{4} \bigcirc \frac{1}{5}$
- 12 $\frac{5}{7} \bigcirc \frac{2}{8}$

Order of Operations

WORKED EXAMPLE

$$2 \times (73 - 11) = \underline{124}$$

33. Order of operations

Follow the order of operations to solve each problem.

- | | | |
|---|---|---|
| 1 $(74 + 94) \times 3 = \underline{\hspace{2cm}}$ | 2 $9 \times (77 + 61) = \underline{\hspace{2cm}}$ | 3 $9 \times (40 + 31) = \underline{\hspace{2cm}}$ |
| 4 $11 \times (15 + 85) = \underline{\hspace{2cm}}$ | 5 $9 \times (17 + 23) = \underline{\hspace{2cm}}$ | 6 $9 \times (80 + 29) = \underline{\hspace{2cm}}$ |
| 7 $(62 + 69) \times 12 = \underline{\hspace{2cm}}$ | 8 $11 \times (93 - 61) = \underline{\hspace{2cm}}$ | 9 $(95 + 59) \times 5 = \underline{\hspace{2cm}}$ |
| 10 $9 \times (52 + 33) = \underline{\hspace{2cm}}$ | 11 $(71 + 64) \times 3 = \underline{\hspace{2cm}}$ | 12 $11 \times (78 + 80) = \underline{\hspace{2cm}}$ |
| 13 $(14 + 67) \times 9 = \underline{\hspace{2cm}}$ | 14 $(26 + 27) \times 12 = \underline{\hspace{2cm}}$ | 15 $(92 + 85) \times 9 = \underline{\hspace{2cm}}$ |
| 16 $12 \times (63 + 63) = \underline{\hspace{2cm}}$ | 17 $12 \times (95 - 71) = \underline{\hspace{2cm}}$ | 18 $9 \times (76 + 58) = \underline{\hspace{2cm}}$ |
| 19 $8 \times (53 + 52) = \underline{\hspace{2cm}}$ | 20 $(12 + 36) \times 11 = \underline{\hspace{2cm}}$ | 21 $12 \times (49 + 76) = \underline{\hspace{2cm}}$ |
| 22 $10 \times (90 + 20) = \underline{\hspace{2cm}}$ | 23 $(93 + 77) \times 9 = \underline{\hspace{2cm}}$ | 24 $5 \times (89 - 25) = \underline{\hspace{2cm}}$ |

34. Order of operations with larger numbers

Follow the order of operations to solve each problem.

- | | |
|---|---|
| 25 $(501 + 418) \times 6 = \underline{\hspace{2cm}}$ | 26 $6 \times (834 + 621) = \underline{\hspace{2cm}}$ |
| 27 $12 \times (966 - 524) = \underline{\hspace{2cm}}$ | 28 $12 \times (933 + 909) = \underline{\hspace{2cm}}$ |
| 29 $(940 - 104) \times 4 = \underline{\hspace{2cm}}$ | 30 $12 \times (935 - 218) = \underline{\hspace{2cm}}$ |
| 31 $(934 + 137) \times 12 = \underline{\hspace{2cm}}$ | 32 $(582 + 160) \times 9 = \underline{\hspace{2cm}}$ |
| 33 $(485 + 261) \times 12 = \underline{\hspace{2cm}}$ | 34 $11 \times (512 + 700) = \underline{\hspace{2cm}}$ |
| 35 $10 \times (224 + 303) = \underline{\hspace{2cm}}$ | 36 $12 \times (670 + 157) = \underline{\hspace{2cm}}$ |
| 37 $(486 + 378) \times 9 = \underline{\hspace{2cm}}$ | 38 $(760 + 361) \times 5 = \underline{\hspace{2cm}}$ |
| 39 $(487 + 848) \times 7 = \underline{\hspace{2cm}}$ | 40 $12 \times (539 + 853) = \underline{\hspace{2cm}}$ |

35. What the digit is worth

Write the value of the highlighted digit.

- | | | |
|--|--|--|
| 41 $32.19\underline{3} \rightarrow \underline{\hspace{2cm}}$ | 42 $76.0\underline{4}2 \rightarrow \underline{\hspace{2cm}}$ | 43 $49.74\underline{8} \rightarrow \underline{\hspace{2cm}}$ |
| 44 $86.\underline{8}62 \rightarrow \underline{\hspace{2cm}}$ | 45 $43.88\underline{1} \rightarrow \underline{\hspace{2cm}}$ | 46 $80.\underline{1}39 \rightarrow \underline{\hspace{2cm}}$ |
| 47 $67.\underline{5}56 \rightarrow \underline{\hspace{2cm}}$ | 48 $42.\underline{6}93 \rightarrow \underline{\hspace{2cm}}$ | 49 $91.63\underline{2} \rightarrow \underline{\hspace{2cm}}$ |
| 50 $71.\underline{2}92 \rightarrow \underline{\hspace{2cm}}$ | | |

Two Patterns Together

WORKED EXAMPLE

ADD 5

5 10 15 20

ADD 10

10 20 30 40

36. Two rules, two patterns

Follow both rules and fill in the missing number.

1

ADD 3	3	6	9	12
ADD 15	15	30	45	

3

ADD 5	5	10	15	20
ADD 15	15	30	45	

5

ADD 3	3	6	9	12
ADD 15	15	30		60

7

ADD 4	4	8	12	
ADD 24	24	48	72	96

9

ADD 6	6		18	24
ADD 24	24	48	72	96

11

ADD 4	4		12	16
ADD 16	16	32	48	64

13

ADD 4	4	8	12	16
ADD 24	24		72	96

15

ADD 6	6	12	18	
ADD 18	18	36	54	72

2

ADD 6	6	12	18	24
ADD 24	24	48		96

4

ADD 6	6	12	18	24
ADD 24	24		72	96

6

ADD 6	6	12	18	24
ADD 24	24	48	72	

8

ADD 4	4	8	12	16
ADD 12	12	24	36	

10

ADD 5	5	10	15	20
ADD 30	30		90	120

12

ADD 5	5	10	15	20
ADD 30	30	60		120

14

ADD 6	6	12	18	
ADD 12	12	24	36	48

16

ADD 5	5	10		20
ADD 30	30	60	90	120

37. Compare decimals

Write >, =, or < between each pair of decimals.

17 $9.3 \square 3.2$

18 $3.81 \square 7.96$

19 $6.6 \square 0.6$

20 $3.71 \square 9.11$

21 $8.3 \square 7.4$

22 $6.75 \square 2.19$

23 $6.79 \square 9.8$

24 $9.6 \square 5.8$

25 $6.66 \square 3.5$

26 $4.33 \square 7.2$

Always, Sometimes or Never

38. Always, sometimes or never

Read each question and write what you work out.

- 1 An even number is bigger than an odd number.

☐ always☐ sometimes☐ never

Why?

- 2 A multiple of 5 is also a multiple of 10.

☐ always☐ sometimes☐ never

Why?

- 3 An odd number times an even number is odd.

☐ always☐ sometimes☐ never

Why?

- 4 Taking away makes a number smaller.

☐ always☐ sometimes☐ never

Why?

- 5 Adding makes a number bigger.

☐ always☐ sometimes☐ never

Why?

- 6 Multiplying makes a number bigger.

☐ always☐ sometimes☐ never

Why?

- 7 You get the same answer whichever way round you subtract two numbers.

☐ always☐ sometimes☐ never

Why?

- 8 The sum of two odd numbers is odd.

☐ always☐ sometimes☐ never

Why?

Answer Key (1 of 9)

Decimal Place Value

What the digit is worth

1. 57.389 (3) $\rightarrow$ 0.3
2. 80.467 (6) $\rightarrow$ 0.06
3. 45.502 (2) $\rightarrow$ 0.002
4. 79.885 (8) $\rightarrow$ 0.8
5. 47.038 (3) $\rightarrow$ 0.03
6. 77.384 (8) $\rightarrow$ 0.08
7. 86.014 (4) $\rightarrow$ 0.004
8. 36.795 (5) $\rightarrow$ 0.005
9. 80.139 (1) $\rightarrow$ 0.1
10. 81.760 (7) $\rightarrow$ 0.7
11. 45.614 (1) $\rightarrow$ 0.01
12. 85.177 (7) $\rightarrow$ 0.007
13. 73.056 (6) $\rightarrow$ 0.006
14. 49.748 (8) $\rightarrow$ 0.008
15. 79.510 (1) $\rightarrow$ 0.01
16. 91.095 (5) $\rightarrow$ 0.005
17. 39.307 (3) $\rightarrow$ 0.3
18. 79.938 (3) $\rightarrow$ 0.03
19. 81.757 (5) $\rightarrow$ 0.05
20. 49.588 (5) $\rightarrow$ 0.5
21. 73.378 (7) $\rightarrow$ 0.07
22. 90.811 (1) $\rightarrow$ 0.01
23. 96.658 (6) $\rightarrow$ 0.6
24. 47.538 (8) $\rightarrow$ 0.008
25. 72.787 (7) $\rightarrow$ 0.007
26. 97.981 (9) $\rightarrow$ 0.9
27. 31.059 (9) $\rightarrow$ 0.009
28. 84.091 (9) $\rightarrow$ 0.09
29. 69.875 (7) $\rightarrow$ 0.07
30. 42.520 (5) $\rightarrow$ 0.5
31. 98.124 (2) $\rightarrow$ 0.02
32. 68.299 (9) $\rightarrow$ 0.009
33. 34.222 (2) $\rightarrow$ 0.02
34. 94.169 (9) $\rightarrow$ 0.009
35. 71.945 (5) $\rightarrow$ 0.005
36. 91.714 (7) $\rightarrow$ 0.7
37. 65.836 (6) $\rightarrow$ 0.006
38. 94.368 (6) $\rightarrow$ 0.06
39. 88.009 (9) $\rightarrow$ 0.009
40. 44.803 (8) $\rightarrow$ 0.8
41. 94.382 (3) $\rightarrow$ 0.3
42. 91.651 (1) $\rightarrow$ 0.001
43. 34.421 (4) $\rightarrow$ 0.4
44. 72.544 (5) $\rightarrow$ 0.5
45. 81.322 (3) $\rightarrow$ 0.3

Decimal Place Value (continued)

What the digit is worth (continued)

46. 33.390 (3) $\rightarrow$ 0.3
47. 94.944 (4) $\rightarrow$ 0.04
48. 77.140 (1) $\rightarrow$ 0.1
49. 82.955 (5) $\rightarrow$ 0.005
50. 42.693 (6) $\rightarrow$ 0.6

Comparing Decimals

Compare decimals

1. $8.2 > 7.21$
2. $7.33 > 5.59$
3. $9.4 > 3.01$
4. $6.62 > 2.81$
5. $6.2 > 1.8$
6. $9.09 > 7.6$
7. $3.43 < 8.53$
8. $8.5 > 6.1$
9. $9.56 > 3.6$
10. $4.82 > 1.84$
11. $9.6 > 7.4$
12. $2.95 < 3.06$
13. $4.71 > 0.74$
14. $9.6 > 6.2$
15. $6.28 < 8.56$
16. $9.87 > 0.47$
17. $6.2 > 4.1$
18. $4.33 < 7.2$
19. $5.83 > 1.10$
20. $1.26 < 9.88$
21. $3.66 < 5.6$
22. $4.20 < 6.57$
23. $4.14 > 2.5$
24. $0.81 < 5.6$
25. $4.04 > 1.81$
26. $9.57 > 4.9$
27. $6.8 < 9.2$
28. $6.79 < 9.8$
29. $4.83 < 7.05$
30. $9.5 > 8.1$
31. $3.81 > 3.5$
32. $9.80 > 3.9$
33. $2.28 < 7.9$
34. $9.97 > 1.21$
35. $6.75 < 8.7$
36. $9.45 > 8.3$
37. $6.7 < 7.95$

Answer Key (2 of 9)

Comparing Decimals (continued)

Compare decimals (continued)

38. $3.50 > 3.15$
39. $5.10 > 2.0$
40. $6.3 > 3.44$
41. $8.96 > 8.59$
42. $2.68 < 4.66$
43. $2.39 < 6.9$
44. $4.40 > 0.91$
45. $4.13 < 4.4$
46. $6.6 > 0.6$
47. $5.76 < 9.43$
48. $8.07 < 8.86$
49. $7.21 > 6.05$
50. $7.4 = 7.40$

Multiplying and Dividing by 10, 100 and 1000

Multiply and divide by 10, 100, 1000

1. $6.54 \div 100 = 0.0654$
2. $7.87 \times 10 = 78.7$
3. $1.57 \div 100 = 0.0157$
4. $3.76 \times 1000 = 3760$
5. $1.6 \times 100 = 160$
6. $7.78 \times 100 = 778$
7. $8.24 \times 10 = 82.4$
8. $2.43 \div 10 = 0.243$
9. $1.1 \times 1000 = 1100$
10. $7.36 \times 100 = 736$
11. $4.94 \times 100 = 494$
12. $2.6 \times 1000 = 2600$
13. $8.64 \times 1000 = 8640$
14. $1.89 \div 10 = 0.189$
15. $7.46 \div 100 = 0.0746$
16. $8.47 \times 10 = 84.7$
17. $3.68 \div 10 = 0.368$
18. $9.28 \div 1000 = 0.00928$
19. $8.27 \times 1000 = 8270$
20. $9.8 \times 10 = 98$
21. $9.68 \div 10 = 0.968$
22. $7.9 \times 100 = 790$
23. $7.06 \times 10 = 70.6$
24. $4.8 \times 100 = 480$
25. $7.64 \times 100 = 764$
26. $8.51 \times 1000 = 8510$
27. $4.44 \div 10 = 0.444$
28. $8.85 \times 1000 = 8850$
29. $9.73 \div 1000 = 0.00973$

Multiplying and Dividing by 10, 100 and 1000 (continued)

Multiply and divide by 10, 100, 1000 (continued)

30. $1.3 \times 100 = 130$
31. $8.39 \times 10 = 83.9$
32. $1.75 \times 1000 = 1750$
33. $4.22 \div 1000 = 0.00422$
34. $4.76 \times 1000 = 4760$
35. $8.35 \times 10 = 83.5$
36. $8.14 \div 1000 = 0.00814$
37. $1.75 \div 10 = 0.175$
38. $6.08 \times 1000 = 6080$
39. $8.23 \times 1000 = 8230$
40. $4.06 \times 10 = 40.6$
41. $7.02 \div 100 = 0.0702$
42. $6.5 \times 1000 = 6500$
43. $2.16 \div 1000 = 0.00216$
44. $7.73 \times 10 = 77.3$
45. $8.9 \times 1000 = 8900$
46. $2.57 \div 1000 = 0.00257$
47. $3.2 \times 1000 = 3200$
48. $9.4 \times 100 = 940$
49. $4.8 \times 1000 = 4800$
50. $4.25 \div 10 = 0.425$

Adding and Subtracting Decimals

Add and subtract decimals

1. $3.24 + 6.02 = 9.26$
2. $3.08 + 18.49 = 21.57$
3. $9.02 + 6.64 = 15.66$
4. $17.52 + 1.17 = 18.69$
5. $1.92 + 7.76 = 9.68$
6. $15.05 + 3.60 = 18.65$
7. $17.52 + 5.57 = 23.09$
8. $6.95 + 8.11 = 15.06$
9. $10.32 + 15.80 = 26.12$
10. $13.60 + 12.04 = 25.64$
11. $9.48 + 7.06 = 16.54$
12. $19.51 + 5.93 = 25.44$
13. $16.81 + 13.52 = 30.33$
14. $10.00 - 0.02 = 9.98$
15. $19.49 + 3.77 = 23.26$
16. $15.93 + 15.05 = 30.98$
17. $14.48 - 5.00 = 9.48$
18. $15.36 + 5.16 = 20.52$
19. $12.28 + 11.97 = 24.25$
20. $8.17 + 4.76 = 12.93$
21. $19.65 + 12.63 = 32.28$

Answer Key (3 of 9)

Adding and Subtracting Decimals (continued)

Add and subtract decimals (continued)

22. $4.27 + 16.29 = 20.56$
23. $17.13 + 14.42 = 31.55$
24. $8.66 + 3.34 = 12.00$

What the digit is worth

25. 61.326 (3) $\rightarrow 0.3$
26. 86.621 (2) $\rightarrow 0.02$
27. 33.618 (1) $\rightarrow 0.01$
28. 81.322 (3) $\rightarrow 0.3$
29. 50.215 (2) $\rightarrow 0.2$
30. 83.260 (6) $\rightarrow 0.06$
31. 82.955 (5) $\rightarrow 0.005$
32. 49.748 (8) $\rightarrow 0.008$
33. 78.061 (1) $\rightarrow 0.001$
34. 99.523 (2) $\rightarrow 0.02$

Multiplying Decimals

Multiply and divide decimals

1. $9.30 \times 9 = 83.70$
2. $7.79 \times 8.8 = 68.552$
3. $10.36 \times 12 = 124.32$
4. $2.61 \times 2.77 = 7.2297$
5. $6.84 \times 1.5 = 10.260$
6. $8.91 \times 2.91 = 25.9281$
7. $7.8 \times 5.08 = 39.624$
8. $0.77 \times 8.0 = 6.160$
9. $8.6 \times 2.24 = 19.264$
10. $6.8 \times 7.04 = 47.872$
11. $8.35 \times 11 = 91.85$
12. $6.8 \times 3.34 = 22.712$
13. $3.1 \times 8.66 = 26.846$
14. $7.98 \times 2.0 = 15.960$
15. $7.1 \times 6.37 = 45.227$
16. $5.26 \times 2.24 = 11.7824$
17. $7.0 \times 9.0 = 63.00$
18. $7.96 \times 2.07 = 16.4772$
19. $6.11 \times 5.3 = 32.383$
20. $4.5 \times 4.8 = 21.60$
21. $7.7 \times 7.96 = 61.292$
22. $6.3 \times 7.97 = 50.211$
23. $0.47 \times 3.92 = 1.8424$
24. $6.67 \times 5 = 33.35$
25. $1.63 \times 4.76 = 7.7588$
26. $6.06 \times 3.6 = 21.816$
27. $2.09 \times 1.2 = 2.508$
28. $8.22 \times 6.11 = 50.2242$

Multiplying Decimals (continued)

Multiply and divide decimals (continued)

29. $3.15 \times 3.06 = 9.6390$
30. $1.18 \times 2.7 = 3.186$
31. $7.43 \times 5.57 = 41.3851$
32. $2.87 \times 4.91 = 14.0917$
33. $3.06 \times 0.51 = 1.5606$
34. $2.90 \times 3.42 = 9.9180$
35. $6.88 \times 4.1 = 28.208$
36. $3.63 \times 1.82 = 6.6066$
37. $7.44 \times 3 = 22.32$
38. $5.33 \times 7.59 = 40.4547$
39. $5.6 \times 6.67 = 37.352$
40. $4.2 \times 1.71 = 7.182$
41. $7.65 \times 2.49 = 19.0485$
42. $7.7 \times 8.55 = 65.835$
43. $9.0 \times 1.67 = 15.030$
44. $8.13 \times 1.23 = 9.9999$

Compare decimals

45. $1.15 < 7.92$
46. $8.25 < 9.96$
47. $0.61 < 6.0$
48. $3.12 < 5.71$
49. $7.6 > 7.2$
50. $5.21 < 5.4$
51. $8.09 < 9.96$
52. $8.2 > 4.74$
53. $3.88 > 2.08$
54. $2.95 < 3.06$

Multiplying Three Digits by Two

Multiply multi-digit numbers

1. $240 \times 98 = 23520$
2. $933 \times 75 = 69975$
3. $451 \times 41 = 18491$
4. $664 \times 61 = 40504$
5. $258 \times 82 = 21156$
6. $879 \times 68 = 59772$
7. $787 \times 74 = 58238$
8. $321 \times 69 = 22149$
9. $952 \times 59 = 56168$
10. $519 \times 86 = 44634$
11. $392 \times 55 = 21560$
12. $638 \times 95 = 60610$
13. $693 \times 76 = 52668$
14. $483 \times 61 = 29463$
15. $921 \times 54 = 49734$

Answer Key (4 of 9)

Multiplying Three Digits by Two (continued)

Multiply multi-digit numbers (continued)

16. $898 \times 53 = 47594$

Multiply and divide by 10, 100, 1000

17. $1.3 \times 100 = 130$

18. $9.34 \div 100 = 0.0934$

19. $4.9 \times 100 = 490$

20. $4.76 \times 1000 = 4760$

21. $3.84 \div 10 = 0.384$

22. $3.2 \times 1000 = 3200$

23. $7.06 \times 10 = 70.6$

24. $0.43 \times 1000 = 430$

25. $7.1 \times 100 = 710$

26. $7.73 \times 10 = 77.3$

Long Division

Long division

1. $4628 \div 52 = 89$

2. $9120 \div 40 = 228$

3. $5875 \div 25 = 235$

4. $8568 \div 42 = 204$

5. $6888 \div 28 = 246$

6. $8856 \div 72 = 123$

7. $9555 \div 15 = 637$

8. $5952 \div 96 = 62$

9. $8944 \div 52 = 172$

10. $7306 \div 13 = 562$

Add and subtract decimals

11. $16.67 - 0.02 = 16.65$

12. $14.11 + 18.26 = 32.37$

13. $14.75 - 4.69 = 10.06$

14. $16.24 + 19.47 = 35.71$

15. $5.46 + 6.89 = 12.35$

16. $15.93 + 15.05 = 30.98$

17. $9.64 + 17.30 = 26.94$

18. $4.96 + 9.30 = 14.26$

19. $7.62 + 18.80 = 26.42$

20. $14.37 + 19.99 = 34.36$

Long Division with Remainders

Long division with remainders

1. $5639 \div 65 = 86 \text{ R } 49$

2. $9554 \div 66 = 144 \text{ R } 50$

3. $6795 \div 83 = 81 \text{ R } 72$

4. $9570 \div 28 = 341 \text{ R } 22$

5. $4456 \div 37 = 120 \text{ R } 16$

6. $7083 \div 35 = 202 \text{ R } 13$

Long Division with Remainders (continued)

Long division with remainders (continued)

7. $7622 \div 43 = 177 \text{ R } 11$

8. $5893 \div 41 = 143 \text{ R } 30$

9. $8493 \div 79 = 107 \text{ R } 40$

10. $9316 \div 18 = 517 \text{ R } 10$

Multiply and divide decimals

11. $7.48 \times 12 = 89.76$

12. $2.56 \times 4.95 = 12.6720$

13. $0.37 \times 5.6 = 2.072$

14. $5.6 \times 8.69 = 48.664$

15. $10.36 \times 12 = 124.32$

16. $8.22 \times 6.11 = 50.2242$

17. $7.4 \times 7.87 = 58.238$

18. $0.26 \times 4.53 = 1.1778$

19. $8.6 \times 2.24 = 19.264$

20. $6.2 \times 6.21 = 38.502$

Equivalent Fractions

Equivalent fractions

1. $1/2 = 4/8$

2. $1/4 = 2/8$

3. $1/2 = 2/4$

4. $3/4 = 6/8$

5. $1/3 = 2/6$

6. $2/3 = 4/6$

7. $1/2 = 3/6$

Simplifying fractions

8. $6/8 = 3/4$

9. $4/8 = 1/2$

10. $2/6 = 1/3$

11. $2/8 = 1/4$

12. $3/6 = 1/2$

13. $4/6 = 2/3$

14. $2/4 = 1/2$

Multiply multi-digit numbers

15. $298 \times 82 = 24436$

16. $682 \times 69 = 47058$

17. $354 \times 52 = 18408$

18. $886 \times 62 = 54932$

19. $637 \times 30 = 19110$

20. $784 \times 99 = 77616$

21. $960 \times 85 = 81600$

22. $449 \times 45 = 20205$

Answer Key (5 of 9)

Multiplying Fractions

Multiplying fractions

1. $\frac{1}{8} \times \frac{1}{3} = \frac{1}{24}$
2. $\frac{1}{3} \times \frac{4}{7} = \frac{4}{21}$
3. $\frac{2}{4} \times \frac{1}{8} = \frac{1}{16}$
4. $\frac{1}{6} \times \frac{1}{4} = \frac{1}{24}$
5. $\frac{1}{8} \times \frac{4}{6} = \frac{1}{12}$
6. $\frac{3}{5} \times \frac{1}{3} = \frac{1}{5}$
7. $\frac{2}{4} \times \frac{4}{6} = \frac{1}{3}$
8. $\frac{4}{6} \times \frac{1}{2} = \frac{1}{3}$
9. $\frac{3}{8} \times \frac{4}{7} = \frac{3}{14}$
10. $\frac{3}{6} \times \frac{3}{6} = \frac{1}{4}$
11. $\frac{1}{7} \times \frac{6}{8} = \frac{3}{28}$
12. $\frac{1}{6} \times \frac{3}{4} = \frac{1}{8}$
13. $\frac{3}{8} \times \frac{3}{4} = \frac{9}{32}$
14. $\frac{1}{4} \times \frac{2}{4} = \frac{1}{8}$
15. $\frac{6}{7} \times \frac{3}{6} = \frac{3}{7}$
16. $\frac{2}{3} \times \frac{3}{5} = \frac{2}{5}$
17. $\frac{2}{4} \times \frac{7}{8} = \frac{7}{16}$
18. $\frac{2}{3} \times \frac{5}{7} = \frac{10}{21}$
19. $\frac{4}{8} \times \frac{3}{8} = \frac{3}{16}$
20. $\frac{5}{7} \times \frac{6}{8} = \frac{15}{28}$
21. $\frac{1}{8} \times \frac{1}{8} = \frac{1}{64}$
22. $\frac{3}{8} \times \frac{1}{6} = \frac{1}{16}$
23. $\frac{2}{5} \times \frac{3}{8} = \frac{3}{20}$
24. $\frac{3}{8} \times \frac{1}{4} = \frac{3}{32}$

Word problems: fractions

25. $\frac{6}{12} - \frac{5}{12} = \frac{1}{12}$ kilogram
26. $\frac{6}{8} - \frac{5}{8} = \frac{1}{8}$ liter
27. $\frac{7}{8} + \frac{5}{8} = 1 \frac{1}{2}$ liters

Mixed Numbers

Adding mixed numbers

1. $2 \frac{3}{7} + 4 \frac{4}{7} = 7$
2. $2 \frac{4}{7} + 1 \frac{4}{7} = 4 \frac{1}{2}$
3. $2 \frac{3}{8} + 3 \frac{1}{8} = 5 \frac{1}{2}$
4. $5 \frac{4}{5} + 1 \frac{2}{5} = 7 \frac{1}{5}$
5. $3 \frac{5}{6} + 3 \frac{5}{6} = 7 \frac{2}{3}$
6. $5 \frac{5}{6} + 5 \frac{5}{6} = 11 \frac{2}{3}$
7. $5 \frac{1}{8} + 3 \frac{1}{8} = 8 \frac{1}{4}$
8. $1 \frac{4}{5} + 1 \frac{2}{5} = 3 \frac{1}{5}$
9. $3 \frac{6}{7} + 4 \frac{1}{7} = 8$
10. $1 \frac{1}{3} + 4 \frac{1}{3} = 5 \frac{2}{3}$
11. $3 \frac{3}{5} + 2 \frac{2}{5} = 6$
12. $5 \frac{7}{8} + 5 \frac{3}{8} = 11 \frac{1}{4}$
13. $1 \frac{2}{7} + 5 \frac{2}{7} = 6 \frac{4}{7}$
14. $5 \frac{6}{7} + 5 \frac{5}{7} = 11 \frac{4}{7}$

Mixed Numbers (continued)

Adding mixed numbers (continued)

15. $3 \frac{2}{7} + 1 \frac{4}{7} = 4 \frac{6}{7}$
16. $5 \frac{2}{5} + 2 \frac{4}{5} = 8 \frac{1}{5}$
17. $5 \frac{6}{7} + 1 \frac{2}{7} = 7 \frac{1}{7}$
18. $2 \frac{3}{5} + 1 \frac{1}{5} = 3 \frac{4}{5}$
19. $2 \frac{6}{7} + 2 \frac{3}{7} = 5 \frac{2}{7}$
20. $2 \frac{5}{6} + 1 \frac{1}{6} = 4$
21. $5 \frac{2}{5} + 2 \frac{1}{5} = 7 \frac{3}{5}$
22. $4 \frac{3}{7} + 5 \frac{5}{7} = 10 \frac{1}{7}$
23. $2 \frac{3}{4} + 5 \frac{3}{4} = 8 \frac{1}{2}$
24. $5 \frac{3}{8} + 1 \frac{1}{8} = 6 \frac{1}{2}$
25. $4 \frac{4}{5} + 5 \frac{2}{5} = 10 \frac{1}{5}$
26. $2 \frac{4}{5} + 1 \frac{2}{5} = 4 \frac{1}{5}$
27. $5 \frac{1}{7} + 2 \frac{4}{7} = 7 \frac{5}{7}$
28. $3 \frac{5}{8} + 5 \frac{5}{8} = 9 \frac{1}{4}$
29. $5 \frac{6}{7} + 4 \frac{5}{7} = 10 \frac{4}{7}$
30. $1 \frac{5}{8} + 2 \frac{1}{8} = 3 \frac{3}{4}$
31. $1 \frac{7}{8} + 4 \frac{3}{8} = 6 \frac{1}{4}$
32. $5 \frac{5}{7} + 3 \frac{4}{7} = 9 \frac{2}{7}$
33. $4 \frac{1}{4} + 4 \frac{1}{4} = 8 \frac{1}{2}$
34. $2 \frac{7}{8} + 3 \frac{7}{8} = 6 \frac{3}{4}$
35. $2 \frac{5}{7} + 1 \frac{6}{7} = 4 \frac{4}{7}$
36. $4 \frac{1}{7} + 3 \frac{4}{7} = 7 \frac{5}{7}$
37. $5 \frac{1}{6} + 4 \frac{5}{6} = 10$
38. $5 \frac{1}{5} + 1 \frac{4}{5} = 7$
39. $1 \frac{4}{7} + 5 \frac{1}{7} = 6 \frac{5}{7}$
40. $3 \frac{4}{7} + 2 \frac{3}{7} = 6$
41. $5 \frac{3}{5} + 5 \frac{1}{5} = 10 \frac{4}{5}$
42. $1 \frac{2}{7} + 2 \frac{6}{7} = 4 \frac{1}{7}$
43. $2 \frac{6}{7} + 1 \frac{5}{7} = 4 \frac{4}{7}$

Long division

44. $6880 \div 86 = 80$
45. $7521 \div 69 = 109$
46. $6111 \div 97 = 63$
47. $7840 \div 56 = 140$
48. $4042 \div 94 = 43$
49. $7553 \div 83 = 91$
50. $8988 \div 42 = 214$
51. $4182 \div 51 = 82$

Decimals as Fractions

Decimals as fractions

1. $0.375 = \frac{3}{8}$
2. $0.625 = \frac{5}{8}$
3. $0.75 = \frac{3}{4}$
4. $0.125 = \frac{1}{8}$

Answer Key (6 of 9)

Decimals as Fractions (continued)

Decimals as fractions (continued)

5. $0.875 = 7/8$
6. $0.6 = 3/5$
7. $0.25 = 1/4$
8. $0.2 = 1/5$
9. $0.8 = 4/5$
10. $0.5 = 1/2$
11. $0.4 = 2/5$

Simplifying fractions

12. $2/8 = 1/4$
13. $6/8 = 3/4$
14. $3/6 = 1/2$
15. $4/8 = 1/2$
16. $2/4 = 1/2$
17. $2/6 = 1/3$
18. $4/6 = 2/3$

Adding Unlike Fractions

Add and subtract fractions

1. $2/4 - 1/3 = 1/6$
2. $4/5 + 6/7 = 58/35$
3. $3/7 - 1/8 = 17/56$
4. $2/3 - 3/5 = 1/15$
5. $3/8 - 1/7 = 13/56$
6. $4/7 + 4/5 = 48/35$
7. $2/7 - 2/8 = 1/28$
8. $6/8 - 2/3 = 1/12$
9. $6/7 - 4/5 = 2/35$
10. $4/5 - 3/7 = 13/35$
11. $4/7 - 3/6 = 1/14$
12. $1/6 + 5/7 = 37/42$
13. $4/7 - 1/3 = 5/21$
14. $5/7 - 2/8 = 13/28$
15. $5/7 - 1/3 = 8/21$
16. $1/3 - 1/4 = 1/12$
17. $2/4 - 1/8 = 3/8$
18. $3/4 - 2/5 = 7/20$
19. $5/7 + 6/8 = 41/28$
20. $7/8 - 5/6 = 1/24$
21. $3/6 - 1/4 = 1/4$
22. $2/5 - 1/8 = 11/40$
23. $3/8 - 1/4 = 1/8$
24. $2/5 - 1/4 = 3/20$
25. $3/5 + 2/4 = 11/10$
26. $3/5 - 4/8 = 1/10$
27. $1/2 - 3/8 = 1/8$

Adding Unlike Fractions (continued)

Add and subtract fractions (continued)

28. $2/3 - 2/6 = 1/3$
29. $6/8 - 5/7 = 1/28$
30. $5/8 - 1/4 = 3/8$
31. $2/3 - 5/8 = 1/24$
32. $4/7 + 3/8 = 53/56$
33. $4/5 - 2/3 = 2/15$
34. $4/8 - 3/7 = 1/14$
35. $5/6 - 5/7 = 5/42$
36. $4/6 - 1/2 = 1/6$
37. $6/7 - 6/8 = 3/28$
38. $1/4 + 5/7 = 27/28$
39. $5/6 - 5/8 = 5/24$
40. $6/7 - 2/3 = 4/21$
41. $4/7 - 1/2 = 1/14$
42. $6/8 - 3/6 = 1/4$
43. $7/8 - 3/6 = 3/8$

Long division with remainders

44. $5848 \div 62 = 94 \text{ R } 20$
45. $7903 \div 91 = 86 \text{ R } 77$
46. $4427 \div 38 = 116 \text{ R } 19$
47. $7074 \div 62 = 114 \text{ R } 6$
48. $6858 \div 67 = 102 \text{ R } 24$
49. $7911 \div 76 = 104 \text{ R } 7$
50. $7658 \div 19 = 403 \text{ R } 1$
51. $6482 \div 78 = 83 \text{ R } 8$

Comparing Fractions

Comparing fractions

1. $1/6 < 3/4$
2. $1/5 < 3/6$
3. $2/4 > 1/4$
4. $3/5 > 2/5$
5. $1/2 > 2/5$
6. $4/5 > 1/2$
7. $2/8 > 1/7$
8. $2/5 < 4/8$
9. $3/5 > 3/6$
10. $2/6 > 1/4$
11. $3/5 = 3/5$
12. $1/6 < 4/7$
13. $6/8 > 1/2$
14. $1/5 < 2/8$
15. $4/5 > 2/5$
16. $1/4 = 2/8$
17. $2/7 = 2/7$

Answer Key (7 of 9)

Comparing Fractions (continued)

Comparing fractions (continued)

18. $2/6 < 2/3$
19. $3/4 < 6/7$
20. $3/8 < 2/4$
21. $2/4 < 2/3$
22. $2/5 > 2/6$
23. $1/2 < 7/8$
24. $4/6 < 7/8$
25. $5/7 > 2/5$
26. $6/7 > 5/8$
27. $5/8 > 1/5$
28. $5/6 < 6/7$
29. $3/4 > 5/8$
30. $2/3 > 2/6$
31. $3/4 < 4/5$
32. $3/5 < 7/8$
33. $7/8 > 4/7$
34. $2/7 > 1/7$
35. $5/8 > 4/8$
36. $1/8 < 2/8$
37. $1/3 < 6/8$
38. $2/4 < 4/6$
39. $7/8 > 3/8$
40. $1/3 > 2/8$
41. $3/4 > 2/5$
42. $3/7 < 2/4$
43. $5/6 > 4/7$
44. $6/7 > 1/6$
45. $6/8 > 2/6$
46. $4/8 > 3/7$
47. $2/4 < 4/5$
48. $3/7 > 1/6$
49. $3/4 > 4/7$
50. $1/6 < 2/7$

Multiplying fractions

51. $4/7 \times 3/8 = 3/14$
52. $1/6 \times 7/8 = 7/48$
53. $1/8 \times 4/6 = 1/12$
54. $1/6 \times 2/8 = 1/24$
55. $1/3 \times 1/4 = 1/12$
56. $2/8 \times 4/7 = 1/7$
57. $3/7 \times 6/7 = 18/49$
58. $3/4 \times 2/6 = 1/4$
59. $1/4 \times 5/6 = 5/24$
60. $3/4 \times 7/8 = 21/32$

The Coordinate Plane

Points on a coordinate grid

1. A = (0, 5)
2. B = (5, 1)
3. C = (4, 2)
4. D = (6, 2)
5. A = (6, 4)
6. B = (5, 3)
7. C = (1, 0)
8. D = (0, 4)
9. A = (6, 1)

Adding mixed numbers

10. $4 \frac{6}{7} + 3 \frac{3}{7} = 8 \frac{2}{7}$
11. $3 \frac{3}{5} + 2 \frac{2}{5} = 6$
12. $1 \frac{5}{8} + 2 \frac{1}{8} = 3 \frac{3}{4}$
13. $5 \frac{4}{5} + 1 \frac{2}{5} = 7 \frac{1}{5}$
14. $4 \frac{3}{4} + 5 \frac{3}{4} = 10 \frac{1}{2}$
15. $2 \frac{5}{8} + 4 \frac{5}{8} = 7 \frac{1}{4}$
16. $5 \frac{1}{7} + 2 \frac{5}{7} = 7 \frac{6}{7}$
17. $4 \frac{2}{7} + 4 \frac{5}{7} = 9$
18. $3 \frac{4}{7} + 2 \frac{4}{7} = 6 \frac{1}{7}$

Volume of Prisms

Volume of a rectangular prism

1. $8 \times 7 \times 5$: 280 cm³
2. $7 \times 7 \times 7 + 4 \times 7 \times 4$: 455 cm³
3. $6 \times 6 \times 7 + 5 \times 6 \times 4$: 372 cm³
4. $6 \times 7 \times 8 + 3 \times 7 \times 6$: 462 cm³
5. $7 \times 6 \times 6 + 5 \times 6 \times 4$: 372 cm³
6. $6 \times 7 \times 6 + 5 \times 7 \times 5$: 427 cm³
7. $6 \times 8 \times 7 + 4 \times 8 \times 7$: 560 cm³

Decimals as fractions

8. 0.375 = $3/8$
9. 0.125 = $1/8$
10. 0.4 = $2/5$
11. 0.625 = $5/8$
12. 0.875 = $7/8$
13. 0.8 = $4/5$
14. 0.75 = $3/4$

Line Plots

Line plots

1. 4 at 8 inches, 2 at 1 inch: $4 - 2 = 2$
2. $1 + 3 + 1 + 1 + 1 + 4 + 2 = 13$
3. longer than 4 inches — 9 sticks
4. 2 at 4 inches, 1 at 10 inches: $2 - 1 = 1$
5. 3 at 8 inches, 2 at 4 inches: $3 - 2 = 1$

Answer Key (8 of 9)

Line Plots (continued)

Line plots (continued)

6. 1 inch — 4 pieces

Comparing fractions

7. $\frac{3}{8} < \frac{2}{5}$
8. $\frac{4}{5} < \frac{5}{6}$
9. $\frac{2}{5} > \frac{1}{4}$
10. $\frac{2}{4} > \frac{2}{7}$
11. $\frac{1}{4} > \frac{1}{5}$
12. $\frac{5}{7} > \frac{2}{8}$

Order of Operations

Order of operations

1. $(74 + 94) \times 3 = 504$
2. $9 \times (77 + 61) = 1242$
3. $9 \times (40 + 31) = 639$
4. $11 \times (15 + 85) = 1100$
5. $9 \times (17 + 23) = 360$
6. $9 \times (80 + 29) = 981$
7. $(62 + 69) \times 12 = 1572$
8. $11 \times (93 - 61) = 352$
9. $(95 + 59) \times 5 = 770$
10. $9 \times (52 + 33) = 765$
11. $(71 + 64) \times 3 = 405$
12. $11 \times (78 + 80) = 1738$
13. $(14 + 67) \times 9 = 729$
14. $(26 + 27) \times 12 = 636$
15. $(92 + 85) \times 9 = 1593$
16. $12 \times (63 + 63) = 1512$
17. $12 \times (95 - 71) = 288$
18. $9 \times (76 + 58) = 1206$
19. $8 \times (53 + 52) = 840$
20. $(12 + 36) \times 11 = 528$
21. $12 \times (49 + 76) = 1500$
22. $10 \times (90 + 20) = 1100$
23. $(93 + 77) \times 9 = 1530$
24. $5 \times (89 - 25) = 320$

Order of operations with larger numbers

25. $(501 + 418) \times 6 = 5514$
26. $6 \times (834 + 621) = 8730$
27. $12 \times (966 - 524) = 5304$
28. $12 \times (933 + 909) = 22104$
29. $(940 - 104) \times 4 = 3344$
30. $12 \times (935 - 218) = 8604$
31. $(934 + 137) \times 12 = 12852$
32. $(582 + 160) \times 9 = 6678$
33. $(485 + 261) \times 12 = 8952$

Order of Operations (continued)

Order of operations with larger numbers (continued)

34. $11 \times (512 + 700) = 13332$
35. $10 \times (224 + 303) = 5270$
36. $12 \times (670 + 157) = 9924$
37. $(486 + 378) \times 9 = 7776$
38. $(760 + 361) \times 5 = 5605$
39. $(487 + 848) \times 7 = 9345$
40. $12 \times (539 + 853) = 16704$

What the digit is worth

41. 32.193 (3) $\rightarrow$ 0.003
42. 76.042 (4) $\rightarrow$ 0.04
43. 49.748 (8) $\rightarrow$ 0.008
44. 86.862 (8) $\rightarrow$ 0.8
45. 43.881 (1) $\rightarrow$ 0.001
46. 80.139 (1) $\rightarrow$ 0.1
47. 67.556 (5) $\rightarrow$ 0.5
48. 42.693 (6) $\rightarrow$ 0.6
49. 91.632 (2) $\rightarrow$ 0.002
50. 71.292 (2) $\rightarrow$ 0.2

Two Patterns Together

Two rules, two patterns

1. Add 3 and add 15 $\rightarrow$ bottom row, term 4 = 60
2. Add 6 and add 24 $\rightarrow$ bottom row, term 3 = 72
3. Add 5 and add 15 $\rightarrow$ bottom row, term 4 = 60
4. Add 6 and add 24 $\rightarrow$ bottom row, term 2 = 48
5. Add 3 and add 15 $\rightarrow$ bottom row, term 3 = 45
6. Add 6 and add 24 $\rightarrow$ bottom row, term 4 = 96
7. Add 4 and add 24 $\rightarrow$ top row, term 4 = 16
8. Add 4 and add 12 $\rightarrow$ bottom row, term 4 = 48
9. Add 6 and add 24 $\rightarrow$ top row, term 2 = 12
10. Add 5 and add 30 $\rightarrow$ bottom row, term 2 = 60
11. Add 4 and add 16 $\rightarrow$ top row, term 2 = 8
12. Add 5 and add 30 $\rightarrow$ bottom row, term 3 = 90
13. Add 4 and add 24 $\rightarrow$ bottom row, term 2 = 48
14. Add 6 and add 12 $\rightarrow$ top row, term 4 = 24
15. Add 6 and add 18 $\rightarrow$ top row, term 4 = 24
16. Add 5 and add 30 $\rightarrow$ top row, term 3 = 15

Compare decimals

17. $9.3 > 3.2$
18. $3.81 < 7.96$
19. $6.6 > 0.6$
20. $3.71 < 9.11$
21. $8.3 > 7.4$
22. $6.75 > 2.19$
23. $6.79 < 9.8$

Answer Key (9 of 9)

Two Patterns Together (continued)

Compare decimals (continued)

24. $9.6 > 5.8$

25. $6.66 > 3.5$

26. $4.33 < 7.2$

Always, Sometimes or Never

Always, sometimes or never

1. An even number is bigger than an odd number. → sometimes
2. A multiple of 5 is also a multiple of 10. → sometimes
3. An odd number times an even number is odd. → never
4. Taking away makes a number smaller. → sometimes
5. Adding makes a number bigger. → sometimes
6. Multiplying makes a number bigger. → sometimes
7. You get the same answer whichever way round you subtract two numbers. → sometimes
8. The sum of two odd numbers is odd. → never

Solutions (1 of 16)

Decimal Place Value

What the digit is worth

1. $57.\underline{3}89 \rightarrow \underline{\hspace{1cm}}$

number: 5 7 . 3 8 9
3 $\rightarrow$ 0.3

The places do not mirror each other around the point — there is no "oneths". Going right they are tenths, hundredths, thousandths: each one ten times SMALLER than the last.

Count in from the point: the 3 sits in the tenths.

Its VALUE is what it is worth there, not the digit itself: 3 in the tenths is 0.3. That gap between "3" and "0.3" is the whole of this topic.

2. $80.4\underline{6}7 \rightarrow \underline{\hspace{1cm}}$

number: 8 0 . 4 6 7
6 $\rightarrow$ 0.06

The places do not mirror each other around the point — there is no "oneths". Going right they are tenths, hundredths, thousandths: each one ten times SMALLER than the last.

Count in from the point: the 6 sits in the hundredths.

Its VALUE is what it is worth there, not the digit itself: 6 in the hundredths is 0.06. That gap between "6" and "0.06" is the whole of this topic.

Comparing Decimals

Compare decimals

1. $8.2 \boxed{?} 7.21$

8.20 ? 7.21
820 hundredths >
721 hundredths
8.2 > 7.21

These count different sized pieces — one is in bigger pieces and the other is not. Longer does NOT mean bigger with decimals, so the first job is to make the pieces match.

Write a zero on the end of the shorter one. 8.2 is the same amount as 8.20 — a zero on the END of a decimal changes nothing.

Now they are both hundredths: 820 against 721. 820 is more. So $8.2 > 7.21$.

Solutions (2 of 16)

Comparing Decimals (continued)

Compare decimals (continued)

2. $7.33 \square 5.59$

$7.33 \quad ? \quad 5.59$
733 hundredths $>$
559 hundredths
 $7.33 \quad > \quad 5.59$

Both have 2 figures after the point already, so they are counting the same sized pieces.

Now they are both hundredths: 733 against 559. 733 is more. So $7.33 > 5.59$.

Multiplying and Dividing by 10, 100 and 1000

Multiply and divide by 10, 100, 1000

1. $6.54 \div 100 = \underline{\hspace{2cm}}$

$6.54 \div 100$
 0.654
 0.0654

100 is 10×10 , so there are 2 moves to make — one for each ten.

$\div 10$ — every digit is worth a tenth as much, so the point steps one place left: 0.654.

And $\div 10$ again — every digit is worth a tenth as much, so the point steps one place left: 0.0654. The digits never changed — only where the point sits. $6.54 \div 100 = 0.0654$.

2. $7.87 \times 10 = \underline{\hspace{2cm}}$

7.87×10
 78.7

10 is a single ten, so there is one move to make.

$\times 10$ — every digit is worth ten times as much, so the point steps one place right: 78.7. The digits never changed — only where the point sits. $7.87 \times 10 = 78.7$.

Solutions (3 of 16)

Adding and Subtracting Decimals

Add and subtract decimals

1.

$$\begin{array}{r} 3.24 \\ + 6.02 \\ \hline 9.26 \end{array}$$

$3.24 + 6.02$. Line the POINTS up under each other — not the right-hand ends. Right-aligning is what turns $12.5 + 3.75$ into a tidy-looking wrong answer.

4 plus 2 makes 6. Write 6.

2 plus 0 makes 2. Write 2.

3 plus 6 makes 9. Write 9.

The point in the answer comes straight down from the ones above it — it was never moved, only lined up. $3.24 + 6.02 = 9.26$.

2.

$$\begin{array}{r} 1 \qquad 1 \\ 3.08 \\ + 18.49 \\ \hline 21.57 \end{array}$$

$3.08 + 18.49$. Line the POINTS up under each other — not the right-hand ends. Right-aligning is what turns $12.5 + 3.75$ into a tidy-looking wrong answer.

8 plus 9 makes 17. More than 9, so write 7 and carry 1 to the left.

Add the carried 1 too: $1 + 0 + 4$ makes 5. Write 5.

3 plus 8 makes 11. More than 9, so write 1 and carry 1 to the left.

Add the carried 1 too: $1 + 0 + 1$ makes 2. Write 2.

The point in the answer comes straight down from the ones above it — it was never moved, only lined up. $3.08 + 18.49 = 21.57$.

Solutions (4 of 16)

Multiplying Decimals

Multiply and divide decimals

1. $9.30 \times 9 =$ _____

$$\begin{array}{r} 9.30 \times 9 \\ 930 \times 9 = 8370 \\ 9.30 \rightarrow 2 \text{ figures} \\ 9 \rightarrow 0 \text{ figures} \\ 8370 \quad 2 \text{ from the right} \\ 9.30 \times 9 = 83.7 \end{array}$$

Do NOT line the points up — that is for adding. For a multiply, take the points off and do it as whole numbers first.

$930 \times 9 = 8370$. Ordinary times-tables, nothing decimal about it.

Now count the figures after the points in the QUESTION: 2 figures in 9.30 and 0 figures in 9 — 2 altogether.

So the answer gets 2 too. Count 2 in from the right of 8370 and put the point there: 83.70. A zero on the very end after the point adds nothing, so write it as 83.7.

2. $7.79 \times 8.8 =$ _____

$$\begin{array}{r} 7.79 \times 8.8 \\ 779 \times 88 = 68552 \\ 7.79 \rightarrow 2 \text{ figures} \\ 8.8 \rightarrow 1 \text{ figure} \\ 68552 \quad 3 \text{ from the right} \\ 7.79 \times 8.8 = 68.552 \end{array}$$

Do NOT line the points up — that is for adding. For a multiply, take the points off and do it as whole numbers first.

$779 \times 88 = 68552$. Ordinary times-tables, nothing decimal about it.

Now count the figures after the points in the QUESTION: 2 figures in 7.79 and 1 figure in 8.8 — 3 altogether.

So the answer gets 3 too. Count 3 in from the right of 68552 and put the point there: 68.552.

Multiplying Three Digits by Two

Multiply multi-digit numbers

1.

$$\begin{array}{r} 240 \\ \times 98 \\ \hline 1920 \\ 21600 \\ \hline 23520 \end{array}$$

240×98 , set out in columns. Split the 98 by place value and take one piece at a time.

The 8 is in the ones, so it is just 8: $240 \times 8 = 1920$.

The 9 is in the tens, so it is worth 90 — not 9. That is why this row is $240 \times 90 = 21600$, and why it ends in 0.

Now add the pieces: $1920 + 21600 = 23520$.

Solutions (5 of 16)

Multiplying Three Digits by Two (continued)

Multiply multi-digit numbers (continued)

2.

$$\begin{array}{r} 933 \\ \times 75 \\ \hline 4665 \\ 65310 \\ \hline 69975 \end{array}$$

933×75 , set out in columns. Split the 75 by place value and take one piece at a time.

The 5 is in the ones, so it is just 5: $933 \times 5 = 4665$.

The 7 is in the tens, so it is worth 70 — not 7. That is why this row is $933 \times 70 = 65310$, and why it ends in 0.

Now add the pieces: $4665 + 65310 = 69975$.

Long Division

Long division

1.

$$\begin{array}{r} 89 \\ 52 \overline{)4628} \\ \underline{416} \\ 468 \\ \underline{468} \\ 0 \end{array}$$

4628 shared into groups of 52. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 52s fit into 462? 8 of them — write the 8 on top. $8 \times 52 = 416$, and $462 - 416$ leaves 46. Bring down the 8, which makes 468.

How many 52s fit into 468? 9 — write it on top. $9 \times 52 = 468$, and $468 - 468$ leaves 0.

Nothing is left to bring down and nothing is left over. $4628 \div 52 = 89$.

2.

$$\begin{array}{r} 228 \\ 40 \overline{)9120} \\ \underline{80} \\ 112 \\ \underline{80} \\ 320 \\ \underline{320} \\ 0 \end{array}$$

9120 shared into groups of 40. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 40s fit into 91? 2 of them — write the 2 on top. $2 \times 40 = 80$, and $91 - 80$ leaves 11. Bring down the 2, which makes 112.

How many 40s fit into 112? 2 — write it on top. $2 \times 40 = 80$, and $112 - 80$ leaves 32. Bring down the 0, which makes 320.

How many 40s fit into 320? 8 — write it on top. $8 \times 40 = 320$, and $320 - 320$ leaves 0.

Nothing is left to bring down and nothing is left over. $9120 \div 40 = 228$.

Solutions (6 of 16)

Long Division with Remainders

Long division with remainders

1.

$$\begin{array}{r} 86 \\ 65 \overline{)5639} \\ \underline{520} \\ 439 \\ \underline{390} \\ 49 \end{array}$$

5639 shared into groups of 65. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 65s fit into 563? 8 of them — write the 8 on top. $8 \times 65 = 520$, and $563 - 520$ leaves 43. Bring down the 9, which makes 439.

How many 65s fit into 439? 6 — write it on top. $6 \times 65 = 390$, and $439 - 390$ leaves 49.

Nothing is left to bring down, and 49 is too small to divide again — so that is the remainder. $5639 \div 65 = 86$ remainder 49.

2.

$$\begin{array}{r} 144 \\ 66 \overline{)9554} \\ \underline{66} \\ 295 \\ \underline{264} \\ 314 \\ \underline{264} \\ 50 \end{array}$$

9554 shared into groups of 66. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 66s fit into 95? 1 of them — write the 1 on top. $1 \times 66 = 66$, and $95 - 66$ leaves 29. Bring down the 5, which makes 295.

How many 66s fit into 295? 4 — write it on top. $4 \times 66 = 264$, and $295 - 264$ leaves 31. Bring down the 4, which makes 314.

How many 66s fit into 314? 4 — write it on top. $4 \times 66 = 264$, and $314 - 264$ leaves 50.

Nothing is left to bring down, and 50 is too small to divide again — so that is the remainder. $9554 \div 66 = 144$ remainder 50.

Equivalent Fractions

Equivalent fractions

1. $\frac{1}{2} = \frac{\quad}{8}$

$$\begin{array}{rclcl} \frac{1}{2} & = & \frac{?}{8} \\ 2 \times 4 & = & 8 \\ 1 \times 4 & = & 4 \\ \frac{1}{2} & = & \frac{4}{8} \end{array}$$

$1/2$ and the answer have to be the SAME amount — so nothing may be added to either half of it. The one move that leaves a fraction's value alone is cutting every piece into the same number of smaller pieces.

Halves into eighths: $8 \div 2 = 4$, so each piece is being cut into 4. There are 4 times as many pieces, and each is 4 times smaller.

The top is a COUNT of those pieces, so it is cut the same way: $1 \times 4 = 4$. $1/2 = 4/8$ — the same amount of cake, cut differently.

Solutions (7 of 16)

Equivalent Fractions (continued)

Equivalent fractions (continued)

2. $\frac{1}{4} = \frac{\quad}{8}$

$$\begin{array}{rclcl} \frac{1}{4} & = & \frac{?}{8} \\ 4 \times 2 & = & 8 \\ 1 \times 2 & = & 2 \\ \frac{1}{4} & = & \frac{2}{8} \end{array}$$

$\frac{1}{4}$ and the answer have to be the SAME amount — so nothing may be added to either half of it. The one move that leaves a fraction's value alone is cutting every piece into the same number of smaller pieces.

Quarters into eighths: $8 \div 4 = 2$, so each piece is being cut into 2. There are 2 times as many pieces, and each is 2 times smaller.

The top is a COUNT of those pieces, so it is cut the same way: $1 \times 2 = 2$. $\frac{1}{4} = \frac{2}{8}$ — the same amount of cake, cut differently.

Multiplying Fractions

Multiplying fractions

1. $\frac{1}{8} \times \frac{1}{3} = \text{—}$

$$\begin{array}{l} \frac{1}{8} \times \frac{1}{3} \\ \text{top: } 1 \times 1 = 1 \\ \frac{1}{8} \times \frac{1}{3} = \frac{1}{24} \end{array}$$

Multiplying, not adding — so no common denominator, and nothing has to be cut into matching pieces first. Tops with tops, bottoms with bottoms.

Multiply the two top numbers: $1 \times 1 = 1$.

Multiply the two bottom numbers: $8 \times 3 = 24$.

2. $\frac{1}{3} \times \frac{4}{7} = \text{—}$

$$\begin{array}{l} \frac{1}{3} \times \frac{4}{7} \\ \text{top: } 1 \times 4 = 4 \\ \frac{1}{3} \times \frac{4}{7} = \frac{4}{21} \end{array}$$

Multiplying, not adding — so no common denominator, and nothing has to be cut into matching pieces first. Tops with tops, bottoms with bottoms.

Multiply the two top numbers: $1 \times 4 = 4$.

Multiply the two bottom numbers: $3 \times 7 = 21$.

Solutions (8 of 16)

Multiplying Fractions (continued)

Word problems: fractions

25. Suki used $\frac{6}{12}$ kilogram of hay in the morning, and Courtney used $\frac{5}{12}$ kilogram later on.

How much more did Suki use than Courtney? ____

asked: How much more did Suki use than Courtney?

$$\frac{6}{12} - \frac{5}{12} = \frac{1}{12}$$

$\frac{1}{12}$ kilogram

Read it through once and do NOTHING. Grabbing the numbers on the first read means choosing an operation before you know the story, and that choice is the only hard part of a word problem.

Now the numbers: $\frac{6}{12}$ and $\frac{5}{12}$. Finding them is not the same as knowing what to do with them — that comes next, and it comes from the story rather than from the numbers.

Something is being taken away or compared. So this one is a subtraction: $\frac{6}{12} - \frac{5}{12}$.

$\frac{6}{12} - \frac{5}{12} = \frac{1}{12}$ kilogram. And answer the question that was ASKED — "How much more did Suki use than Courtney?" — in kilogram, because the sum on its own is not yet an answer.

26. Maya added some to $\frac{5}{8}$ liter of water and ended up with $\frac{6}{8}$ liter.

How much did Maya add? ____

asked: How much did Maya add?

$$\frac{6}{8} - \frac{5}{8} = \frac{1}{8}$$

$\frac{1}{8}$ liter

Read it through once and do NOTHING. Grabbing the numbers on the first read means choosing an operation before you know the story, and that choice is the only hard part of a word problem.

Now the numbers: $\frac{6}{8}$ and $\frac{5}{8}$. Finding them is not the same as knowing what to do with them — that comes next, and it comes from the story rather than from the numbers.

Something is being taken away or compared. So this one is a subtraction: $\frac{6}{8} - \frac{5}{8}$.

$\frac{6}{8} - \frac{5}{8} = \frac{1}{8}$ liter. And answer the question that was ASKED — "How much did Maya add?" — in liter, because the sum on its own is not yet an answer.

Solutions (9 of 16)

Mixed Numbers

Adding mixed numbers

1. $2\frac{3}{7} + 4\frac{4}{7} = \underline{\quad} \text{ — }$

$$\begin{array}{rcl} \frac{3}{7} & + & \frac{4}{7} = \frac{7}{7} \\ 2 & + & 4 = 6 \\ & & = \mathbf{7} \end{array}$$

A mixed number is a whole and a fraction stuck together. Deal with them separately — wholes with wholes, sevenths with sevenths.

The fractions go together first: $\frac{3}{7} + \frac{4}{7} = \frac{7}{7}$.

Then the wholes: $2 + 4 = 6$.

But $\frac{7}{7}$ is exactly one whole — $\frac{7}{7}$ is 1 — so nothing is left over as a fraction: $6 + 1 = 7$.

So the answer is 7.

2. $2\frac{4}{7} + 1\frac{4}{7} = \underline{\quad} \text{ — }$

$$\begin{array}{rcl} \frac{4}{7} & + & \frac{4}{7} = \frac{8}{7} \\ 2 & + & 1 = 3 \\ & & = \mathbf{4} \mathbf{\frac{1}{7}} \end{array}$$

A mixed number is a whole and a fraction stuck together. Deal with them separately — wholes with wholes, sevenths with sevenths.

The fractions go together first: $\frac{4}{7} + \frac{4}{7} = \frac{8}{7}$.

Then the wholes: $2 + 1 = 3$.

But $\frac{8}{7}$ is more than one whole — $\frac{7}{7}$ is 1 — so it splits into 1 and $\frac{1}{7}$. Give that whole one to the wholes: $3 + 1 = 4$.

So the answer is $4\frac{1}{7}$.

Decimals as Fractions

Decimals as fractions

1. $0.375 \rightarrow \text{ — }$

$$\begin{array}{rcl} 0.375 & = & \frac{375}{1000} \\ 375 & \div & 125 = \mathbf{3} \\ 1000 & \div & 125 = \mathbf{8} \\ \frac{375}{1000} & = & \mathbf{\frac{3}{8}} \end{array}$$

A decimal already IS a fraction — 0.375 is 375 thousandths. That is what the places after the point mean.

125 goes into both 375 and 1000, so take it off both: $375 \div 125 = 3$ and $1000 \div 125 = 8$. $\frac{375}{1000}$ and $\frac{3}{8}$ are the same amount, and 8 is as far down as it goes.

Solutions (10 of 16)

Decimals as Fractions (continued)

Decimals as fractions (continued)

2. $0.625 \rightarrow \text{—}$

$$0.625 = \frac{625}{1000}$$

$$625 \div 125 = 5$$

$$1000 \div 125 = 8$$

$$\frac{625}{1000} = \frac{5}{8}$$

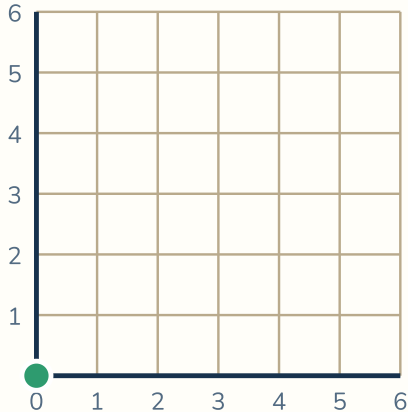
A decimal already IS a fraction — 0.625 is 625 thousandths. That is what the places after the point mean.

125 goes into both 625 and 1000, so take it off both: $625 \div 125 = 5$ and $1000 \div 125 = 8$. $625/1000$ and $5/8$ are the same amount, and 8 is as far down as it goes.

The Coordinate Plane

Points on a coordinate grid

1. $A = \text{—}$



Start at the corner where the two lines meet — that is (0, 0), and every reading begins there.

Along the bottom FIRST: count 0 across. Always this one before the other, because until you have gone along you do not know which line to go up.

Then up: count 5. Now the two numbers have been used in the order they are written.

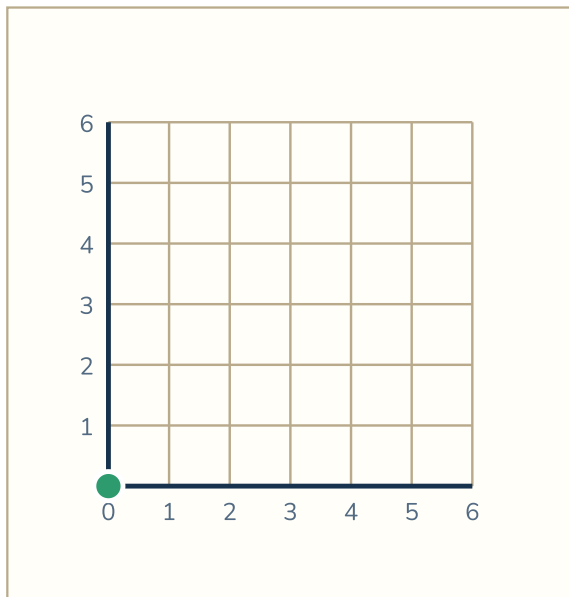
So point A is (0, 5). Swap the two round and you would be at (5, 0) — somewhere else entirely, which is why the order is the whole of this.

Solutions (11 of 16)

The Coordinate Plane (continued)

Points on a coordinate grid (continued)

2. B = _____



Start at the corner where the two lines meet — that is (0, 0), and every reading begins there.

Along the bottom FIRST: count 5 across. Always this one before the other, because until you have gone along you do not know which line to go up.

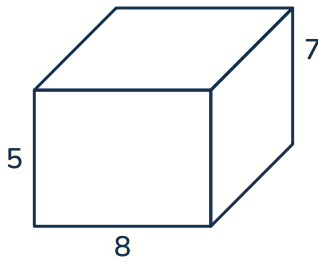
Then up: count 1. Now the two numbers have been used in the order they are written.

So point B is (5, 1) — 5 across, then 1 up. (1, 5) would be a different point altogether.

Volume of Prisms

Volume of a rectangular prism

1.



_____ cm³

$$\text{base: } 8 \times 7 = 56$$

$$56 \times 5 = \mathbf{280 \text{ cubic cm}}$$

Volume is always the same idea: work out the area of the BASE, then see how many of those stack up to the top. Three numbers multiplied is what that comes to, not a rule of its own.

The base is a 8 by 7 rectangle, so its area is 56 square cm — that is one layer.

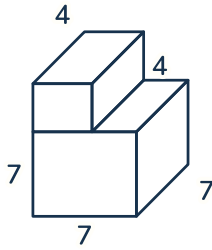
Stack 5 of those layers: $56 \times 5 = 280$ cubic cm. Cubic, not square — a volume is three lengths multiplied, so the unit is cubed.

Solutions (12 of 16)

Volume of Prisms (continued)

Volume of a rectangular prism (continued)

2.



_____ cm³

filled box: 539

notch: 84

$$539 - 84 = \mathbf{455 \text{ cubic cm}}$$

A block standing on a slab. There is no formula for this shape — the job is to turn it into boxes, which do have one, and there is more than one way.

First way: cut it into the two boxes it already is. The slab underneath is $7 \times 7 \times 7 = 343$, and the block standing on it is $4 \times 7 \times 4 = 112$.

$$343 + 112 = 455 \text{ cubic cm.}$$

Second way: fill the notch in to make one big box. That box is $7 \times 7 \times 11 = 539$, and the notch taken back off is $3 \times 7 \times 4 = 84$.

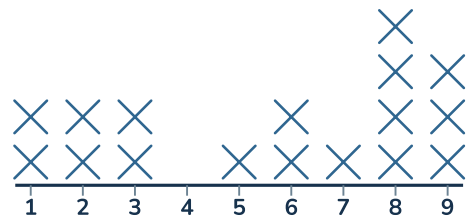
$539 - 84 = 455$ cubic cm. Two methods agreeing is how you know.

Solutions (13 of 16)

Line Plots

Line plots

1. Length of the feathers (inches)



How many more feathers measured 8 inches than 1 inch?

—

- 1 inches: 2 feathers
- 2 inches: 2 feathers
- 3 inches: 2 feathers
- 5 inches: 1 feathers
- 6 inches: 2 feathers
- 7 inches: 1 feathers
- 8 inches: 4 feathers
- 9 inches: 3 feathers

2

A line plot is not bars to read off a scale — each mark is one feather. So the number **ALONG** the bottom and the number of marks **ABOVE** it are two different quantities, and the question wants one of them.

Counting the stacks: 2 at 1, 2 at 2, 2 at 3, 1 at 5, 2 at 6, 1 at 7, 4 at 8, 3 at 9.

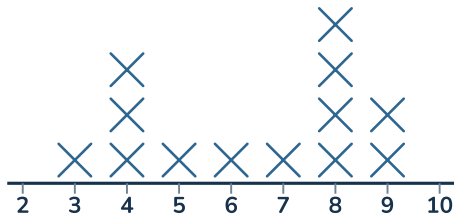
4 at 8 inches, 2 at 1 inch: $4 - 2 = 2$ — so the answer is 2.

Solutions (14 of 16)

Line Plots (continued)

Line plots (continued)

2. Length of the craft sticks (inches)



How many sticks were measured altogether?

—

3 inches: 1 sticks
4 inches: 3 sticks
5 inches: 1 sticks
6 inches: 1 sticks
7 inches: 1 sticks
8 inches: 4 sticks
9 inches: 2 sticks

13

A line plot is not bars to read off a scale — each mark is one stick. So the number **ALONG** the bottom and the number of marks **ABOVE** it are two different quantities, and the question wants one of them.

Counting the stacks: 1 at 3, 3 at 4, 1 at 5, 1 at 6, 1 at 7, 4 at 8, 2 at 9.

$1 + 3 + 1 + 1 + 1 + 4 + 2 = 13$ — so the answer is 13.

Order of Operations

Order of operations

1. $(74 + 94) \times 3 = \underline{\hspace{2cm}}$

$$\begin{array}{ccccccc} (& 74 & + & 94 &) & \times & 3 \\ & 168 & & \times & 3 & & \\ & & & 504 & & & \end{array}$$

Work inside the brackets first. $74 + 94 = 168$.

$\times$ and $\div$ come before $+$ and $-$, so this goes first. $168 \times 3 = 504$.

Nothing is left to work out, so the answer is 504.

2. $9 \times (77 + 61) = \underline{\hspace{2cm}}$

$$\begin{array}{ccccccc} 9 & \times & (& 77 & + & 61 &) \\ & 9 & & \times & 138 & & \\ & & & 1242 & & & \end{array}$$

Work inside the brackets first. $77 + 61 = 138$.

$\times$ and $\div$ come before $+$ and $-$, so this goes first. $9 \times 138 = 1242$.

Nothing is left to work out, so the answer is 1242.

Solutions (15 of 16)

Two Patterns Together

Two rules, two patterns

1. **ADD 3**

ADD 15

3	6	9	12
15	30	45	

row 1: 3 → 15
row 2: 6 → 30
row 3: 9 → 45
row 4: 12 → 60

Two patterns, and each column counts in its own step — so a gap CAN be filled by counting down its own column. But that is not what a table of pairs is for: the two sides are locked to each other, and the same link works on every row.

Read the link off a row with nothing missing. Row 1: 3 on the left, 15 on the right — that is $\times 5$.

The same link holds all the way down, so use it on the gap: $12 \times 5 = 60$.

Counting down the column gets there too — this is not a trick — but the link is what the two patterns were put next to each other to show.

2. **ADD 6**

ADD 24

6	12	18	24
24	48		96

row 1: 6 → 24
row 2: 12 → 48
row 3: 18 → 72
row 4: 24 → 96

Two patterns, and each column counts in its own step — so a gap CAN be filled by counting down its own column. But that is not what a table of pairs is for: the two sides are locked to each other, and the same link works on every row.

Read the link off a row with nothing missing. Row 1: 6 on the left, 24 on the right — that is $\times 4$.

The same link holds all the way down, so use it on the gap: $18 \times 4 = 72$.

Counting down the column gets there too — this is not a trick — but the link is what the two patterns were put next to each other to show.

Solutions (16 of 16)

Always, Sometimes or Never

Always, sometimes or never

1. An even number is bigger than an odd number.

- always
- sometimes
- never

Why?

always

sometimes

never

sometimes

Before trying anything, notice what each answer would COST. One example that works proves nothing at all. One that fails rules out "always" on its own. They are not the same size of evidence.

So hunt for a counter-example — a case where the claim breaks. That is the cheapest question to ask, and its answer decides between all three.

Try 24 and 9 — true. Try 8 and 27 — false. One example is not enough. So the answer is sometimes.

2. A multiple of 5 is also a multiple of 10.

- always
- sometimes
- never

Why?

always

sometimes

never

sometimes

Before trying anything, notice what each answer would COST. One example that works proves nothing at all. One that fails rules out "always" on its own. They are not the same size of evidence.

So hunt for a counter-example — a case where the claim breaks. That is the cheapest question to ask, and its answer decides between all three.

Try 20 — true. Try 15 — false. One example is not enough. So the answer is sometimes.