

Grade 5 Foundation Workbook

20 lessons · printable · answer key at the back

Name _____ Date _____

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Decimal Place Value

WORKED EXAMPLE

 $44.\underline{8}15 \rightarrow \underline{0.8}$

1. What the digit is worth

Write the value of the highlighted digit.

- | | | | | | |
|----|-------------------------|----|-------------------------|----|-------------------------|
| 1 | 23.55 <u>6</u> → _____ | 2 | 5. <u>9</u> 59 → _____ | 3 | 57. <u>3</u> 89 → _____ |
| 4 | 10.1 <u>3</u> 7 → _____ | 5 | 12.16 <u>5</u> → _____ | 6 | 24. <u>8</u> 56 → _____ |
| 7 | 45.50 <u>2</u> → _____ | 8 | 17.8 <u>6</u> 7 → _____ | 9 | 16.7 <u>8</u> 8 → _____ |
| 10 | 28.00 <u>8</u> → _____ | 11 | 47.0 <u>3</u> 8 → _____ | 12 | 19. <u>7</u> 02 → _____ |
| 13 | 4.8 <u>1</u> 0 → _____ | 14 | 36.79 <u>5</u> → _____ | 15 | 30. <u>8</u> 01 → _____ |
| 16 | 24.96 <u>5</u> → _____ | 17 | 4. <u>7</u> 28 → _____ | 18 | 45.6 <u>1</u> 4 → _____ |
| 19 | 27.67 <u>3</u> → _____ | 20 | 0.28 <u>6</u> → _____ | 21 | 49.74 <u>8</u> → _____ |
| 22 | 4.7 <u>4</u> 8 → _____ | 23 | 15.9 <u>6</u> 8 → _____ | 24 | 29.71 <u>9</u> → _____ |
| 25 | 39. <u>3</u> 07 → _____ | 26 | 16. <u>2</u> 50 → _____ | 27 | 10.1 <u>2</u> 0 → _____ |
| 28 | 49. <u>5</u> 88 → _____ | 29 | 25.1 <u>1</u> 6 → _____ | 30 | 30.7 <u>9</u> 7 → _____ |
| 31 | 15. <u>5</u> 03 → _____ | 32 | 47.53 <u>8</u> → _____ | 33 | 28.89 <u>9</u> → _____ |
| 34 | 4. <u>1</u> 13 → _____ | 35 | 31.05 <u>9</u> → _____ | 36 | 14. <u>3</u> 70 → _____ |
| 37 | 20.4 <u>5</u> 2 → _____ | 38 | 42. <u>5</u> 20 → _____ | 39 | 1. <u>4</u> 92 → _____ |
| 40 | 28.35 <u>3</u> → _____ | 41 | 16. <u>7</u> 03 → _____ | 42 | 34.2 <u>2</u> 2 → _____ |
| 43 | 21.11 <u>7</u> → _____ | 44 | 24.6 <u>5</u> 4 → _____ | 45 | 65.83 <u>6</u> → _____ |
| 46 | 22. <u>4</u> 95 → _____ | 47 | 13.6 <u>1</u> 4 → _____ | 48 | 44. <u>8</u> 03 → _____ |
| 49 | 22.64 <u>7</u> → _____ | 50 | 15. <u>7</u> 30 → _____ | | |

Comparing Decimals

WORKED EXAMPLE

$$0.8 \boxed{<} 7.5$$

2. Compare decimals

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

1 $4.1 \boxed{\phantom{<}} 0.39$

2 $3.5 \boxed{\phantom{<}} 2.7$

3 $8.2 \boxed{\phantom{<}} 7.21$

4 $4.8 \boxed{\phantom{<}} 1.4$

5 $2.4 \boxed{\phantom{<}} 2.9$

6 $1.2 \boxed{\phantom{<}} 3.3$

7 $9.4 \boxed{\phantom{<}} 3.01$

8 $4.5 \boxed{\phantom{<}} 8.55$

9 $0.8 \boxed{\phantom{<}} 5.4$

10 $0.10 \boxed{\phantom{<}} 7.92$

11 $6.2 \boxed{\phantom{<}} 1.8$

12 $0.7 \boxed{\phantom{<}} 4.6$

13 $3.6 \boxed{\phantom{<}} 9.7$

14 $8.5 \boxed{\phantom{<}} 6.1$

15 $0.9 \boxed{\phantom{<}} 1.5$

16 $0.36 \boxed{\phantom{<}} 0.6$

17 $5.1 \boxed{\phantom{<}} 2.83$

18 $9.6 \boxed{\phantom{<}} 7.4$

19 $3.4 \boxed{\phantom{<}} 4.2$

20 $0.7 \boxed{\phantom{<}} 2.12$

21 $9.6 \boxed{\phantom{<}} 6.2$

22 $5.9 \boxed{\phantom{<}} 4.1$

23 $4.3 \boxed{\phantom{<}} 7.08$

24 $2.8 \boxed{\phantom{<}} 8.37$

25 $6.2 \boxed{\phantom{<}} 4.1$

26 $1.2 \boxed{\phantom{<}} 6.01$

27 $4.0 \boxed{\phantom{<}} 2.84$

28 $1.26 \boxed{\phantom{<}} 9.88$

29 $1.4 \boxed{\phantom{<}} 0.90$

30 $0.30 \boxed{\phantom{<}} 8.0$

31 $1.3 \boxed{\phantom{<}} 1.9$

32 $0.81 \boxed{\phantom{<}} 5.6$

33 $3.1 \boxed{\phantom{<}} 1.80$

34 $0.3 \boxed{\phantom{<}} 0.8$

35 $6.8 \boxed{\phantom{<}} 9.2$

36 $2.1 \boxed{\phantom{<}} 9.60$

37 $5.1 \boxed{\phantom{<}} 5.10$

38 $9.5 \boxed{\phantom{<}} 8.1$

39 $3.4 \boxed{\phantom{<}} 9.01$

40 $0.7 \boxed{\phantom{<}} 7.0$

41 $0.29 \boxed{\phantom{<}} 2.32$

42 $2.28 \boxed{\phantom{<}} 7.9$

43 $2.6 \boxed{\phantom{<}} 6.4$

44 $3.5 \boxed{\phantom{<}} 2.80$

45 $6.7 \boxed{\phantom{<}} 7.95$

46 $2.0 \boxed{\phantom{<}} 0.2$

47 $0.44 \boxed{\phantom{<}} 9.5$

48 $6.3 \boxed{\phantom{<}} 3.44$

49 $0.8 \boxed{\phantom{<}} 4.78$

50 $1.6 \boxed{\phantom{<}} 1.51$

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 $0.29 \div 10 =$ _____ | 2 $3.4 \div 1000 =$ _____ |
| 3 $6.54 \div 100 =$ _____ | 4 $4.3 \div 1000 =$ _____ |
| 5 $1.3 \div 1000 =$ _____ | 6 $1.6 \div 10 =$ _____ |
| 7 $1.57 \div 100 =$ _____ | 8 $8.6 \div 100 =$ _____ |
| 9 $6.8 \div 100 =$ _____ | 10 $2.4 \div 100 =$ _____ |
| 11 $1.6 \times 100 =$ _____ | 12 $0.3 \div 1000 =$ _____ |
| 13 $9.3 \div 10 =$ _____ | 14 $2.43 \div 10 =$ _____ |
| 15 $2.9 \div 10 =$ _____ | 16 $8.1 \div 10 =$ _____ |
| 17 $1.4 \div 1000 =$ _____ | 18 $4.94 \times 100 =$ _____ |
| 19 $1.3 \times 10 =$ _____ | 20 $0.7 \div 10 =$ _____ |
| 21 $1.89 \div 10 =$ _____ | 22 $0.2 \times 100 =$ _____ |
| 23 $0.15 \times 100 =$ _____ | 24 $0.25 \div 10 =$ _____ |
| 25 $3.68 \div 10 =$ _____ | 26 $7.8 \div 1000 =$ _____ |
| 27 $2.2 \div 1000 =$ _____ | 28 $9.8 \times 10 =$ _____ |
| 29 $4.9 \times 10 =$ _____ | 30 $0.58 \div 1000 =$ _____ |
| 31 $0.04 \times 1000 =$ _____ | 32 $4.8 \times 100 =$ _____ |
| 33 $4.4 \times 10 =$ _____ | 34 $0.1 \div 100 =$ _____ |
| 35 $4.44 \div 10 =$ _____ | 36 $0.5 \times 100 =$ _____ |
| 37 $1.1 \div 10 =$ _____ | 38 $1.3 \times 100 =$ _____ |
| 39 $0.84 \div 1000 =$ _____ | 40 $0.44 \div 10 =$ _____ |
| 41 $5.6 \div 10 =$ _____ | 42 $4.22 \div 1000 =$ _____ |
| 43 $0.42 \div 100 =$ _____ | 44 $7.2 \div 1000 =$ _____ |
| 45 $1.75 \div 10 =$ _____ | 46 $1.5 \div 100 =$ _____ |
| 47 $0.6 \div 1000 =$ _____ | 48 $4.06 \times 10 =$ _____ |
| 49 $6.7 \div 1000 =$ _____ | 50 $5.8 \div 10 =$ _____ |

Adding and Subtracting Decimals

WORKED EXAMPLE

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

4. Add and subtract decimals

Add or subtract the decimals.

$$\begin{array}{r} 1 \quad 18.74 \\ - 15.87 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \quad 6.67 \\ - 3.81 \\ \hline \end{array}$$

$$\begin{array}{r} 3 \quad 3.24 \\ + 6.02 \\ \hline \end{array}$$

$$\begin{array}{r} 4 \quad 17.30 \\ - 10.67 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \quad 0.38 \\ + 4.29 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \quad 18.57 \\ - 10.78 \\ \hline \end{array}$$

$$\begin{array}{r} 7 \quad 9.02 \\ + 6.64 \\ \hline \end{array}$$

$$\begin{array}{r} 8 \quad 2.77 \\ + 2.94 \\ \hline \end{array}$$

$$\begin{array}{r} 9 \quad 15.07 \\ - 11.29 \\ \hline \end{array}$$

$$\begin{array}{r} 10 \quad 9.87 \\ - 3.68 \\ \hline \end{array}$$

$$\begin{array}{r} 11 \quad 1.92 \\ + 7.76 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \quad 3.43 \\ - 1.09 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \quad 7.74 \\ - 0.75 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \quad 6.95 \\ + 8.11 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \quad 14.59 \\ - 6.63 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \quad 12.88 \\ - 6.76 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \quad 6.08 \\ - 5.20 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \quad 9.48 \\ + 7.06 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \quad 6.49 \\ - 3.26 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \quad 12.92 \\ - 8.23 \\ \hline \end{array}$$

$$\begin{array}{r} 21 \quad 10.00 \\ - 0.02 \\ \hline \end{array}$$

$$\begin{array}{r} 22 \quad 17.21 \\ - 16.56 \\ \hline \end{array}$$

$$\begin{array}{r} 23 \quad 9.24 \\ - 3.95 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \quad 3.75 \\ + 0.28 \\ \hline \end{array}$$

5. What the digit is worth

Write the value of the highlighted digit.

25 $29.\underline{8}25 \rightarrow$ _____

26 $29.60\underline{9} \rightarrow$ _____

27 $61.\underline{3}26 \rightarrow$ _____

28 $17.99\underline{4} \rightarrow$ _____

29 $2.\underline{7}52 \rightarrow$ _____

30 $5.\underline{4}01 \rightarrow$ _____

31 $33.6\underline{1}8 \rightarrow$ _____

32 $1.\underline{9}46 \rightarrow$ _____

33 $29.74\underline{4} \rightarrow$ _____

34 $27.\underline{9}23 \rightarrow$ _____

Multiplying Decimals

WORKED EXAMPLE

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

6. Multiply and divide decimals

Multiply the decimals.

- | | | |
|------------------------------|------------------------------|------------------------------|
| 1 $8.9 \times 3 =$ _____ | 2 $5.1 \times 3.6 =$ _____ | 3 $1.91 \times 8.1 =$ _____ |
| 4 $11.0 \times 4 =$ _____ | 5 $1.3 \times 0.71 =$ _____ | 6 $7.8 \times 6 =$ _____ |
| 7 $9.03 \times 7 =$ _____ | 8 $4.56 \times 0.2 =$ _____ | 9 $11.8 \times 11 =$ _____ |
| 10 $5.5 \times 1.1 =$ _____ | 11 $7.18 \times 6 =$ _____ | 12 $1.4 \times 10 =$ _____ |
| 13 $2.9 \times 0.12 =$ _____ | 14 $1.1 \times 5.38 =$ _____ | 15 $7.5 \times 9 =$ _____ |
| 16 $0.6 \times 8.1 =$ _____ | 17 $0.67 \times 6 =$ _____ | 18 $7.2 \times 2.13 =$ _____ |
| 19 $0.16 \times 7.0 =$ _____ | 20 $0.60 \times 3 =$ _____ | 21 $1.90 \times 4.1 =$ _____ |
| 22 $9.1 \times 6 =$ _____ | 23 $1.7 \times 11 =$ _____ | 24 $2.16 \times 5 =$ _____ |
| 25 $4.89 \times 1.5 =$ _____ | 26 $0.3 \times 10 =$ _____ | 27 $5.5 \times 7 =$ _____ |
| 28 $5.41 \times 4 =$ _____ | 29 $6.9 \times 0.25 =$ _____ | 30 $8.51 \times 2 =$ _____ |
| 31 $0.41 \times 3 =$ _____ | 32 $3.31 \times 2.8 =$ _____ | 33 $5.3 \times 12 =$ _____ |
| 34 $11.0 \times 5 =$ _____ | 35 $1.95 \times 12 =$ _____ | 36 $3.9 \times 3 =$ _____ |
| 37 $3.26 \times 5 =$ _____ | 38 $6.82 \times 3 =$ _____ | 39 $3.56 \times 5 =$ _____ |
| 40 $3.74 \times 4 =$ _____ | 41 $3.1 \times 3 =$ _____ | 42 $0.37 \times 5.6 =$ _____ |
| 43 $5.0 \times 2.6 =$ _____ | 44 $4.2 \times 7 =$ _____ | |

7. Compare decimals

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

- | | | | |
|-----------------------|-----------------------|------------------------|----------------------|
| 45 $0.20 \square 5.7$ | 46 $2.8 \square 1.3$ | 47 $9.8 \square 9.62$ | 48 $5.0 \square 5.0$ |
| 49 $0.9 \square 6.7$ | 50 $1.8 \square 9.2$ | 51 $1.26 \square 9.88$ | 52 $4.2 \square 7.4$ |
| 53 $4.6 \square 3.5$ | 54 $5.1 \square 2.83$ | | |

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.

$$\begin{array}{r}
 1 \quad 320 \\
 \times 18 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 2 \quad 150 \\
 \times 11 \\
 \hline
 \end{array}$$

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

$$\begin{array}{r}
 4 \quad 646 \\
 \times 24 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 5 \quad 442 \\
 \times 19 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 6 \quad 107 \\
 \times 96 \\
 \hline
 \end{array}$$

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

$$\begin{array}{r}
 8 \quad 211 \\
 \times 14 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 9 \quad 228 \\
 \times 59 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 10 \quad 138 \\
 \times 65 \\
 \hline
 \end{array}$$

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

$$\begin{array}{r}
 12 \quad 508 \\
 \times 30 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 13 \quad 129 \\
 \times 69 \\
 \hline
 \end{array}$$

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

$$\begin{array}{r}
 15 \quad 941 \\
 \times 12 \\
 \hline
 \end{array}$$

8. Multiply multi-digit numbers (continued)

Multiply. Show your working.

$$\begin{array}{r} 16 \quad 189 \\ \times \quad 34 \\ \hline \end{array}$$

9. Multiply and divide by 10, 100, 1000

Multiply or divide by moving the decimal point.

17 $2.4 \div 100 = \underline{\hspace{2cm}}$

18 $0.3 \div 1000 = \underline{\hspace{2cm}}$

19 $1.3 \times 100 = \underline{\hspace{2cm}}$

20 $3.5 \div 100 = \underline{\hspace{2cm}}$

21 $1.3 \times 10 = \underline{\hspace{2cm}}$

22 $2.8 \times 10 = \underline{\hspace{2cm}}$

23 $4.9 \times 100 = \underline{\hspace{2cm}}$

24 $0.44 \div 10 = \underline{\hspace{2cm}}$

25 $0.49 \div 100 = \underline{\hspace{2cm}}$

26 $5.2 \div 1000 = \underline{\hspace{2cm}}$

Long Division

WORKED EXAMPLE

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

10. Long division

Divide. Show your working.

1

$$47 \overline{)3431}$$

2

$$17 \overline{)2839}$$

3

$$52 \overline{)4628}$$

4

$$27 \overline{)3051}$$

5

$$48 \overline{)3456}$$

6

$$32 \overline{)1472}$$

7

$$25 \overline{)5875}$$

8

$$26 \overline{)2730}$$

9

$$76 \overline{)1444}$$

10

$$70 \overline{)2030}$$

11. Add and subtract decimals

Add or subtract the decimals.

$$\begin{array}{r} 11 \quad 6.94 \\ - 4.43 \\ \hline \end{array}$$

$$\begin{array}{r} 12 \quad 9.30 \\ - 5.10 \\ \hline \end{array}$$

$$\begin{array}{r} 13 \quad 16.67 \\ - 0.02 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \quad 2.94 \\ - 1.60 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \quad 15.13 \\ - 11.88 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \quad 13.48 \\ - 7.18 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \quad 14.75 \\ - 4.69 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \quad 11.16 \\ - 8.76 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \quad 15.48 \\ - 12.36 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \quad 17.36 \\ - 14.73 \\ \hline \end{array}$$

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.

$$\begin{array}{l} 1 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 2 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 3 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 4 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 5 \quad \underline{\quad} \text{ R } \underline{\quad} \\ 91 \overline{)3319} \quad 98 \overline{)1196} \quad 65 \overline{)5639} \quad 89 \overline{)2325} \quad 38 \overline{)2835} \end{array}$$

$$\begin{array}{l} 6 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 7 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 8 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 9 \quad \underline{\quad} \text{ R } \underline{\quad} \quad 10 \quad \underline{\quad} \text{ R } \underline{\quad} \\ 91 \overline{)1835} \quad 83 \overline{)6795} \quad 72 \overline{)1953} \quad 31 \overline{)1467} \quad 33 \overline{)2890} \end{array}$$

13. Multiply and divide decimals

Multiply the decimals.

11 $5.5 \times 7 = \underline{\quad}$

12 $7.8 \times 6 = \underline{\quad}$

13 $7.48 \times 12 = \underline{\quad}$

14 $0.82 \times 3 = \underline{\quad}$

15 $0.75 \times 3 = \underline{\quad}$

16 $4.4 \times 4 = \underline{\quad}$

17 $0.37 \times 5.6 = \underline{\quad}$

18 $7.9 \times 11 = \underline{\quad}$

19 $0.60 \times 3 = \underline{\quad}$

20 $12.0 \times 9 = \underline{\quad}$

Equivalent Fractions

14. Equivalent fractions

Write the missing number that makes the fractions equal.

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

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

$$3 \quad \frac{1}{2} = \frac{\quad}{8}$$

$$4 \quad \frac{2}{3} = \frac{\quad}{6}$$

$$5 \quad \frac{1}{2} = \frac{\quad}{6}$$

$$6 \quad \frac{1}{4} = \frac{\quad}{8}$$

$$7 \quad \frac{3}{4} = \frac{\quad}{8}$$

15. Simplifying fractions

Write each fraction in simplest form.

$$8 \quad \frac{2}{6} = \frac{\quad}{\quad}$$

$$9 \quad \frac{3}{6} = \frac{\quad}{\quad}$$

$$10 \quad \frac{6}{8} = \frac{\quad}{\quad}$$

$$11 \quad \frac{4}{6} = \frac{\quad}{\quad}$$

$$12 \quad \frac{2}{4} = \frac{\quad}{\quad}$$

$$13 \quad \frac{4}{8} = \frac{\quad}{\quad}$$

$$14 \quad \frac{2}{8} = \frac{\quad}{\quad}$$

16. Multiply multi-digit numbers

Multiply. Show your working.

$$15 \quad \begin{array}{r} 371 \\ \times 31 \\ \hline \end{array}$$

$$16 \quad \begin{array}{r} 139 \\ \times 75 \\ \hline \end{array}$$

$$17 \quad \begin{array}{r} 298 \\ \times 82 \\ \hline \end{array}$$

$$18 \quad \begin{array}{r} 300 \\ \times 53 \\ \hline \end{array}$$

$$19 \quad \begin{array}{r} 107 \\ \times 62 \\ \hline \end{array}$$

$$20 \quad \begin{array}{r} 254 \\ \times 35 \\ \hline \end{array}$$

$$21 \quad \begin{array}{r} 354 \\ \times 52 \\ \hline \end{array}$$

$$22 \quad \begin{array}{r} 393 \\ \times 14 \\ \hline \end{array}$$

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

2 $\frac{7}{8} \times \frac{1}{7} = \text{—}$

3 $\frac{4}{5} \times \frac{3}{5} = \text{—}$

4 $\frac{3}{8} \times \frac{5}{7} = \text{—}$

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

6 $\frac{7}{8} \times \frac{2}{8} = \text{—}$

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

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

9 $\frac{1}{3} \times \frac{1}{2} = \text{—}$

10 $\frac{1}{8} \times \frac{2}{5} = \text{—}$

11 $\frac{1}{6} \times \frac{5}{6} = \text{—}$

12 $\frac{1}{8} \times \frac{5}{7} = \text{—}$

13 $\frac{1}{3} \times \frac{2}{4} = \text{—}$

14 $\frac{4}{7} \times \frac{2}{8} = \text{—}$

15 $\frac{2}{7} \times \frac{3}{8} = \text{—}$

16 $\frac{4}{6} \times \frac{2}{6} = \text{—}$

17 $\frac{2}{4} \times \frac{6}{8} = \text{—}$

18 $\frac{2}{8} \times \frac{6}{8} = \text{—}$

19 $\frac{1}{2} \times \frac{5}{6} = \text{—}$

20 $\frac{1}{4} \times \frac{1}{6} = \text{—}$

21 $\frac{3}{4} \times \frac{2}{7} = \text{—}$

22 $\frac{6}{8} \times \frac{2}{8} = \text{—}$

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

24 $\frac{4}{7} \times \frac{2}{5} = \text{—}$

18. Word problems: fractions

Read each problem. Write the answer.

- 25 Elena's recipe uses $\frac{4}{6}$ kilogram of rice for the dough and $\frac{1}{6}$ kilogram more for the topping.

How much rice does Elena need in all?

- 26 Courtney's recipe uses $\frac{7}{8}$ cup of flour for the dough and $\frac{4}{8}$ cup more for the topping.

How much flour does Courtney need in all?

- 27 Priya used $\frac{8}{12}$ liter of paint and Jordan used $\frac{5}{12}$ liter.

How much more did Priya use than Jordan?

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

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

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

10 $5\frac{3}{8} + 1\frac{1}{8} = \underline{\hspace{1cm}}$

13 $1\frac{5}{8} + 2\frac{1}{8} = \underline{\hspace{1cm}}$

16 $4\frac{1}{7} + 3\frac{4}{7} = \underline{\hspace{1cm}}$

19 $5\frac{3}{5} + 5\frac{1}{5} = \underline{\hspace{1cm}}$

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

25 $3\frac{6}{7} + 4\frac{1}{7} = \underline{\hspace{1cm}}$

28 $3\frac{3}{5} + 2\frac{2}{5} = \underline{\hspace{1cm}}$

31 $5\frac{4}{7} + 5\frac{2}{7} = \underline{\hspace{1cm}}$

34 $1\frac{3}{5} + 4\frac{1}{5} = \underline{\hspace{1cm}}$

37 $2\frac{3}{8} + 4\frac{1}{8} = \underline{\hspace{1cm}}$

40 $5\frac{2}{7} + 3\frac{2}{7} = \underline{\hspace{1cm}}$

43 $4\frac{2}{5} + 5\frac{1}{5} = \underline{\hspace{1cm}}$

2 $5\frac{1}{8} + 3\frac{1}{8} = \underline{\hspace{1cm}}$

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

8 $2\frac{3}{5} + 1\frac{1}{5} = \underline{\hspace{1cm}}$

11 $5\frac{4}{5} + 1\frac{2}{5} = \underline{\hspace{1cm}}$

14 $3\frac{5}{6} + 3\frac{5}{6} = \underline{\hspace{1cm}}$

17 $1\frac{4}{7} + 5\frac{1}{7} = \underline{\hspace{1cm}}$

20 $4\frac{2}{7} + 2\frac{2}{7} = \underline{\hspace{1cm}}$

23 $1\frac{4}{7} + 1\frac{1}{7} = \underline{\hspace{1cm}}$

26 $4\frac{1}{5} + 2\frac{3}{5} = \underline{\hspace{1cm}}$

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

32 $5\frac{7}{8} + 5\frac{3}{8} = \underline{\hspace{1cm}}$

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

38 $5\frac{2}{5} + 2\frac{4}{5} = \underline{\hspace{1cm}}$

41 $5\frac{1}{8} + 2\frac{5}{8} = \underline{\hspace{1cm}}$

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

6 $3\frac{2}{7} + 1\frac{4}{7} = \underline{\hspace{1cm}}$

9 $5\frac{2}{5} + 2\frac{1}{5} = \underline{\hspace{1cm}}$

12 $5\frac{1}{7} + 2\frac{4}{7} = \underline{\hspace{1cm}}$

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

18 $5\frac{5}{6} + 5\frac{5}{6} = \underline{\hspace{1cm}}$

21 $1\frac{4}{5} + 1\frac{2}{5} = \underline{\hspace{1cm}}$

24 $3\frac{1}{6} + 1\frac{1}{6} = \underline{\hspace{1cm}}$

27 $2\frac{1}{5} + 4\frac{3}{5} = \underline{\hspace{1cm}}$

30 $1\frac{1}{5} + 5\frac{3}{5} = \underline{\hspace{1cm}}$

33 $2\frac{4}{7} + 2\frac{2}{7} = \underline{\hspace{1cm}}$

36 $1\frac{1}{5} + 3\frac{3}{5} = \underline{\hspace{1cm}}$

39 $2\frac{2}{5} + 2\frac{2}{5} = \underline{\hspace{1cm}}$

42 $5\frac{6}{7} + 1\frac{2}{7} = \underline{\hspace{1cm}}$

20. Long division

Divide. Show your working.

44

$$10 \overline{) 3690}$$

45

$$86 \overline{) 3010}$$

46

$$86 \overline{) 6880}$$

47

$$88 \overline{) 3696}$$

48

$$54 \overline{) 3132}$$

49

$$93 \overline{) 1860}$$

50

$$97 \overline{) 6111}$$

51

$$25 \overline{) 2700}$$

Decimals as Fractions

21. Decimals as fractions

Write each decimal as a fraction in simplest form.

$$1 \quad 0.75 \rightarrow \text{—}$$

$$2 \quad 0.6 \rightarrow \text{—}$$

$$3 \quad 0.375 \rightarrow \text{—}$$

$$4 \quad 0.25 \rightarrow \text{—}$$

$$5 \quad 0.2 \rightarrow \text{—}$$

$$6 \quad 0.8 \rightarrow \text{—}$$

$$7 \quad 0.625 \rightarrow \text{—}$$

$$8 \quad 0.5 \rightarrow \text{—}$$

$$9 \quad 0.4 \rightarrow \text{—}$$

$$10 \quad 0.125 \rightarrow \text{—}$$

$$11 \quad 0.875 \rightarrow \text{—}$$

22. Simplifying fractions

Write each fraction in simplest form.

$$12 \quad \frac{3}{6} = \text{—}$$

$$13 \quad \frac{2}{4} = \text{—}$$

$$14 \quad \frac{2}{8} = \text{—}$$

$$15 \quad \frac{2}{6} = \text{—}$$

$$16 \quad \frac{4}{6} = \text{—}$$

$$17 \quad \frac{6}{8} = \text{—}$$

$$18 \quad \frac{4}{8} = \text{—}$$

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

4 $\frac{5}{7} + \frac{6}{8} = \text{—}$

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

10 $\frac{5}{6} + \frac{2}{3} = \text{—}$

13 $\frac{3}{7} - \frac{1}{8} = \text{—}$

16 $\frac{4}{5} + \frac{5}{6} = \text{—}$

19 $\frac{6}{8} + \frac{1}{2} = \text{—}$

22 $\frac{1}{6} + \frac{6}{7} = \text{—}$

25 $\frac{1}{4} + \frac{7}{8} = \text{—}$

28 $\frac{1}{7} + \frac{1}{4} = \text{—}$

31 $\frac{4}{6} + \frac{5}{7} = \text{—}$

34 $\frac{4}{6} + \frac{5}{8} = \text{—}$

37 $\frac{1}{4} + \frac{1}{5} = \text{—}$

40 $\frac{6}{8} - \frac{2}{3} = \text{—}$

43 $\frac{7}{8} + \frac{3}{4} = \text{—}$

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

5 $\frac{2}{4} - \frac{1}{3} = \text{—}$

8 $\frac{1}{4} + \frac{5}{7} = \text{—}$

11 $\frac{2}{7} + \frac{3}{5} = \text{—}$

14 $\frac{2}{3} + \frac{1}{2} = \text{—}$

17 $\frac{6}{8} + \frac{1}{5} = \text{—}$

20 $\frac{2}{3} - \frac{3}{5} = \text{—}$

23 $\frac{1}{8} + \frac{5}{7} = \text{—}$

26 $\frac{3}{6} + \frac{2}{7} = \text{—}$

29 $\frac{2}{4} + \frac{5}{6} = \text{—}$

32 $\frac{3}{7} + \frac{1}{5} = \text{—}$

35 $\frac{1}{8} + \frac{3}{6} = \text{—}$

38 $\frac{2}{5} + \frac{3}{4} = \text{—}$

41 $\frac{1}{6} + \frac{1}{5} = \text{—}$

3 $\frac{1}{6} + \frac{5}{7} = \text{—}$

6 $\frac{3}{5} + \frac{2}{4} = \text{—}$

9 $\frac{3}{4} + \frac{6}{8} = \text{—}$

12 $\frac{1}{3} + \frac{2}{6} = \text{—}$

15 $\frac{2}{7} + \frac{2}{5} = \text{—}$

18 $\frac{4}{5} + \frac{5}{8} = \text{—}$

21 $\frac{2}{7} + \frac{5}{8} = \text{—}$

24 $\frac{4}{8} + \frac{2}{5} = \text{—}$

27 $\frac{3}{8} - \frac{1}{7} = \text{—}$

30 $\frac{2}{8} + \frac{1}{7} = \text{—}$

33 $\frac{2}{7} - \frac{2}{8} = \text{—}$

36 $\frac{6}{8} + \frac{2}{4} = \text{—}$

39 $\frac{1}{2} + \frac{6}{8} = \text{—}$

42 $\frac{1}{7} + \frac{1}{8} = \text{—}$

24. Long division with remainders

Divide. Give the quotient and the remainder.

$$\begin{array}{r} \text{44} \qquad \quad _ \text{ R } _ \text{45} \\ 49 \overline{) 1046} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{46} \\ 13 \overline{) 3573} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{47} \\ 62 \overline{) 5848} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{48} \\ 24 \overline{) 1573} \end{array} \quad \begin{array}{r} _ \text{ R } _ \\ 22 \overline{) 2715} \end{array}$$

$$\begin{array}{r} \text{49} \qquad \quad _ \text{ R } _ \text{50} \\ 93 \overline{) 1628} \end{array} \quad \begin{array}{r} _ \text{ R } _ \text{51} \\ 38 \overline{) 4427} \end{array} \quad \begin{array}{r} _ \text{ R } _ \\ 32 \overline{) 3332} \end{array}$$

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

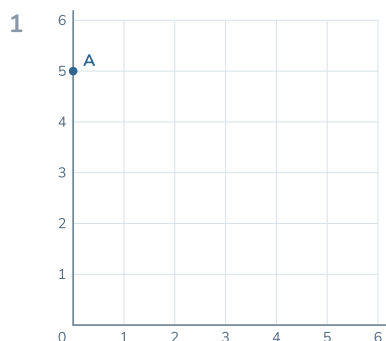
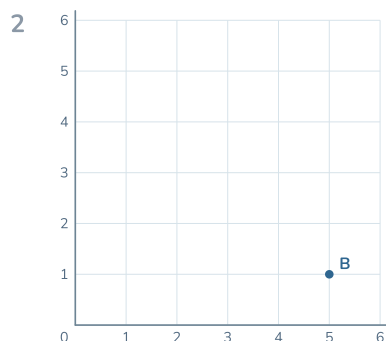
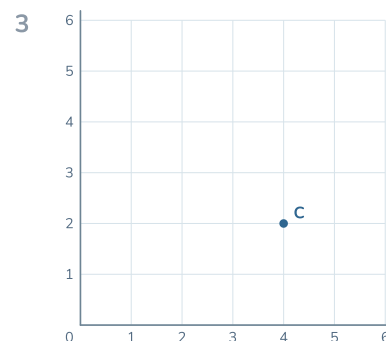
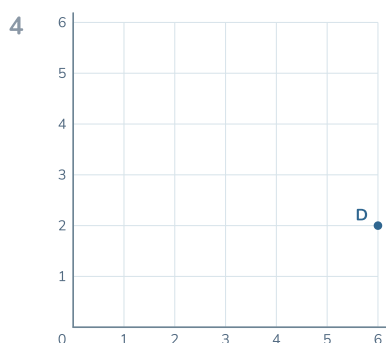
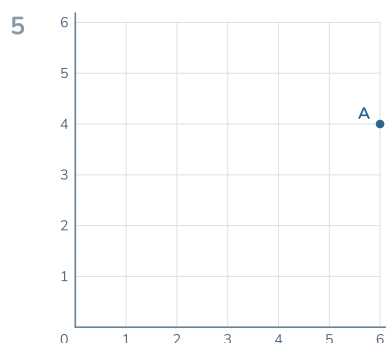
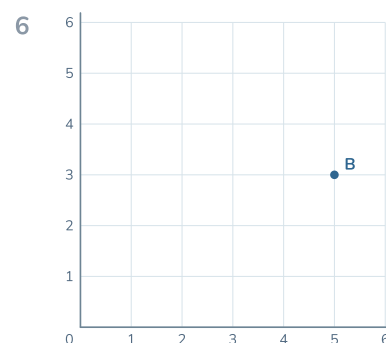
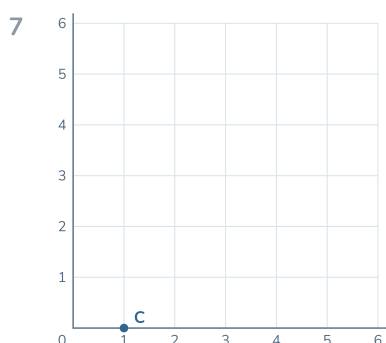
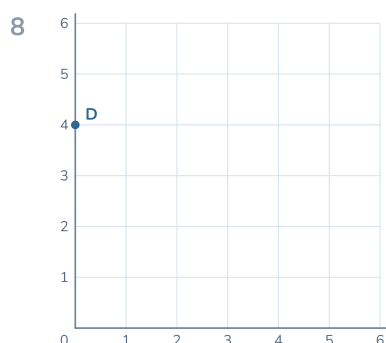
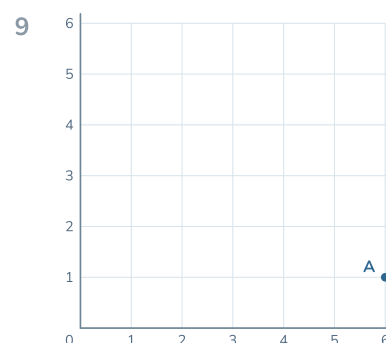
The Coordinate Plane

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.

$$10 \quad 1\frac{5}{8} + 2\frac{1}{8} = \underline{\quad} \text{ —}$$

$$11 \quad 5\frac{1}{7} + 2\frac{5}{7} = \underline{\quad} \text{ —}$$

$$12 \quad 4\frac{6}{7} + 3\frac{3}{7} = \underline{\quad} \text{ —}$$

$$13 \quad 2\frac{3}{7} + 4\frac{3}{7} = \underline{\quad} \text{ —}$$

$$14 \quad 3\frac{4}{7} + 2\frac{1}{7} = \underline{\quad} \text{ —}$$

$$15 \quad 3\frac{1}{7} + 4\frac{4}{7} = \underline{\quad} \text{ —}$$

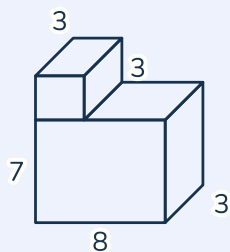
$$16 \quad 3\frac{3}{5} + 2\frac{2}{5} = \underline{\quad} \text{ —}$$

$$17 \quad 1\frac{1}{8} + 5\frac{1}{8} = \underline{\quad} \text{ —}$$

$$18 \quad 5\frac{1}{5} + 3\frac{2}{5} = \underline{\quad} \text{ —}$$

Volume of Prisms

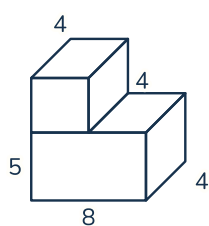
WORKED EXAMPLE

**195** cm³

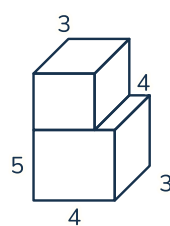
29. Volume of a rectangular prism

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

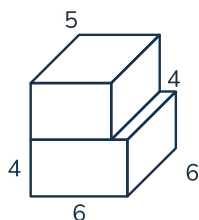
1

_____ cm³

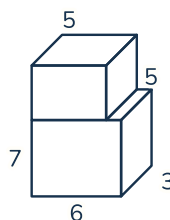
2

_____ cm³

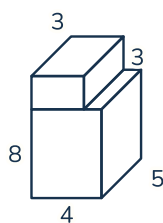
3

_____ cm³

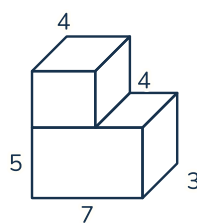
4

_____ cm³

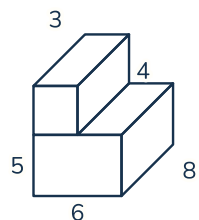
5

_____ cm³

6

_____ cm³

7

_____ cm³

30. Decimals as fractions

Write each decimal as a fraction in simplest form.

⁸ 0.4 → —

⁹ 0.6 → —

¹⁰ 0.375 → —

¹¹ 0.8 → —

¹² 0.2 → —

¹³ 0.5 → —

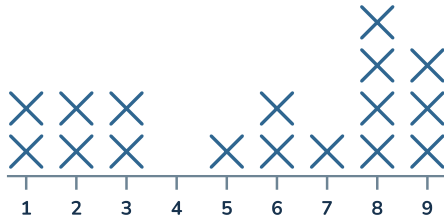
¹⁴ 0.125 → —

Line Plots

31. Line plots

Read each line plot and answer the question.

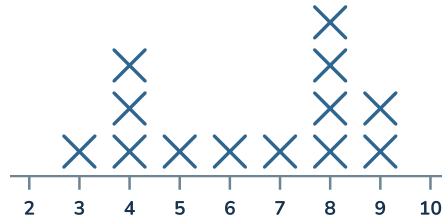
Length of the feathers (inches)



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

—

Length of the craft sticks (inches)



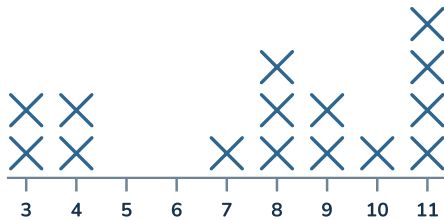
- 2 How many sticks were measured altogether?

—

- 3 How many sticks were longer than 4 inches?

—

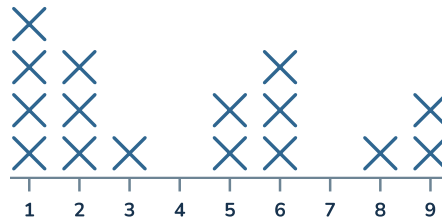
Height of the bean plants (inches)



- 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 $(79 - 78) \times 8 = \underline{\hspace{2cm}}$ | 2 $4 \times (27 + 24) = \underline{\hspace{2cm}}$ | 3 $(74 + 94) \times 3 = \underline{\hspace{2cm}}$ |
| 4 $4 \times (81 - 71) = \underline{\hspace{2cm}}$ | 5 $(92 - 49) \times 3 = \underline{\hspace{2cm}}$ | 6 $4 \times (15 + 19) = \underline{\hspace{2cm}}$ |
| 7 $9 \times (40 + 31) = \underline{\hspace{2cm}}$ | 8 $(62 + 23) \times 2 = \underline{\hspace{2cm}}$ | 9 $6 \times (97 - 92) = \underline{\hspace{2cm}}$ |
| 10 $10 \times (65 - 55) = \underline{\hspace{2cm}}$ | 11 $9 \times (17 + 23) = \underline{\hspace{2cm}}$ | 12 $2 \times (59 + 26) = \underline{\hspace{2cm}}$ |
| 13 $2 \times (72 - 61) = \underline{\hspace{2cm}}$ | 14 $11 \times (93 - 61) = \underline{\hspace{2cm}}$ | 15 $(63 - 56) \times 4 = \underline{\hspace{2cm}}$ |
| 16 $(38 - 29) \times 9 = \underline{\hspace{2cm}}$ | 17 $(99 - 82) \times 6 = \underline{\hspace{2cm}}$ | 18 $(71 + 64) \times 3 = \underline{\hspace{2cm}}$ |
| 19 $(42 + 74) \times 2 = \underline{\hspace{2cm}}$ | 20 $2 \times (44 + 52) = \underline{\hspace{2cm}}$ | 21 $(26 + 27) \times 12 = \underline{\hspace{2cm}}$ |
| 22 $(41 - 20) \times 6 = \underline{\hspace{2cm}}$ | 23 $(53 + 30) \times 3 = \underline{\hspace{2cm}}$ | 24 $(37 + 21) \times 3 = \underline{\hspace{2cm}}$ |

34. Order of operations with larger numbers

Follow the order of operations to solve each problem.

- | | |
|---|---|
| 25 $3 \times (814 - 672) = \underline{\hspace{2cm}}$ | 26 $6 \times (730 - 418) = \underline{\hspace{2cm}}$ |
| 27 $(501 + 418) \times 6 = \underline{\hspace{2cm}}$ | 28 $7 \times (856 - 494) = \underline{\hspace{2cm}}$ |
| 29 $11 \times (959 - 857) = \underline{\hspace{2cm}}$ | 30 $2 \times (415 + 349) = \underline{\hspace{2cm}}$ |
| 31 $12 \times (966 - 524) = \underline{\hspace{2cm}}$ | 32 $(822 - 821) \times 10 = \underline{\hspace{2cm}}$ |
| 33 $(668 + 528) \times 2 = \underline{\hspace{2cm}}$ | 34 $6 \times (171 + 115) = \underline{\hspace{2cm}}$ |
| 35 $(940 - 104) \times 4 = \underline{\hspace{2cm}}$ | 36 $(826 - 566) \times 2 = \underline{\hspace{2cm}}$ |
| 37 $(647 + 208) \times 3 = \underline{\hspace{2cm}}$ | 38 $(582 + 160) \times 9 = \underline{\hspace{2cm}}$ |
| 39 $9 \times (458 - 439) = \underline{\hspace{2cm}}$ | 40 $(108 + 399) \times 4 = \underline{\hspace{2cm}}$ |

35. What the digit is worth

Write the value of the highlighted digit.

- | | | |
|--|--|--|
| 41 $12.\underline{9}86 \rightarrow \underline{\hspace{2cm}}$ | 42 $13.0\underline{9}7 \rightarrow \underline{\hspace{2cm}}$ | 43 $32.19\underline{3} \rightarrow \underline{\hspace{2cm}}$ |
| 44 $24.4\underline{2}3 \rightarrow \underline{\hspace{2cm}}$ | 45 $16.1\underline{5}1 \rightarrow \underline{\hspace{2cm}}$ | 46 $24.\underline{8}56 \rightarrow \underline{\hspace{2cm}}$ |
| 47 $49.74\underline{8} \rightarrow \underline{\hspace{2cm}}$ | 48 $25.1\underline{1}6 \rightarrow \underline{\hspace{2cm}}$ | 49 $19.4\underline{4}8 \rightarrow \underline{\hspace{2cm}}$ |
| 50 $10.90\underline{3} \rightarrow \underline{\hspace{2cm}}$ | | |

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 4	4		12	16
ADD 8	8	16	24	32

3

ADD 4	4		12	16
ADD 16	16	32	48	64

5

ADD 3	3	6		12
ADD 12	12	24	36	48

7

ADD 3	3	6	9	12
ADD 12	12	24		48

9

ADD 2	2	4		8
ADD 12	12	24	36	48

11

ADD 6	6	12		24
ADD 18	18	36	54	72

13

ADD 4	4	8	12	16
ADD 8	8	16	24	

15

ADD 3	3		9	12
ADD 6	6	12	18	24

2

ADD 3	3	6		12
ADD 9	9	18	27	36

4

ADD 3	3	6	9	12
ADD 6	6	12	18	

6

ADD 2	2		6	8
ADD 10	10	20	30	40

8

ADD 2	2	4	6	
ADD 8	8	16	24	32

10

ADD 2	2	4	6	8
ADD 4	4	8	12	

12

ADD 2	2	4	6	8
ADD 10	10	20		40

14

ADD 3	3	6	9	12
ADD 15	15	30	45	

16

ADD 3	3	6	9	
ADD 6	6	12	18	24

37. Compare decimals

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

17 $3.3 \square 8.16$

18 $1.8 \square 9.2$

19 $8.7 \square 4.4$

20 $4.8 \square 2.85$

21 $2.1 \square 9.60$

22 $2.9 \square 7.08$

23 $1.35 \square 9.6$

24 $2.9 \square 7.48$

25 $3.0 \square 3.00$

26 $1.8 \square 6.4$

Always, Sometimes or Never

38. Always, sometimes or never

Read each question and write what you work out.

- 1 A number that ends in 0 is even.

☐ always

☐ sometimes

☐ never

Why?

- 2 The sum of two even numbers is even.

☐ always

☐ sometimes

☐ never

Why?

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

☐ always

☐ sometimes

☐ never

Why?

- 4 A number that ends in 5 is even.

☐ always

☐ sometimes

☐ never

Why?

- 5 You get the same answer whichever way round you multiply two numbers.

☐ always

☐ sometimes

☐ never

Why?

- 6 The product of two odd numbers is odd.

☐ always

☐ sometimes

☐ never

Why?

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

☐ always

☐ sometimes

☐ never

Why?

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

☐ always

☐ sometimes

☐ never

Why?

Answer Key (1 of 9)

Decimal Place Value

What the digit is worth

1. 23.556 (6) $\rightarrow$ 0.006
2. 5.959 (9) $\rightarrow$ 0.9
3. 57.389 (3) $\rightarrow$ 0.3
4. 10.137 (3) $\rightarrow$ 0.03
5. 12.165 (5) $\rightarrow$ 0.005
6. 24.856 (8) $\rightarrow$ 0.8
7. 45.502 (2) $\rightarrow$ 0.002
8. 17.867 (6) $\rightarrow$ 0.06
9. 16.788 (8) $\rightarrow$ 0.08
10. 28.008 (8) $\rightarrow$ 0.008
11. 47.038 (3) $\rightarrow$ 0.03
12. 19.702 (7) $\rightarrow$ 0.7
13. 4.810 (1) $\rightarrow$ 0.01
14. 36.795 (5) $\rightarrow$ 0.005
15. 30.801 (8) $\rightarrow$ 0.8
16. 24.965 (5) $\rightarrow$ 0.005
17. 4.728 (7) $\rightarrow$ 0.7
18. 45.614 (1) $\rightarrow$ 0.01
19. 27.673 (3) $\rightarrow$ 0.003
20. 0.286 (6) $\rightarrow$ 0.006
21. 49.748 (8) $\rightarrow$ 0.008
22. 4.748 (4) $\rightarrow$ 0.04
23. 15.968 (6) $\rightarrow$ 0.06
24. 29.719 (9) $\rightarrow$ 0.009
25. 39.307 (3) $\rightarrow$ 0.3
26. 16.250 (2) $\rightarrow$ 0.2
27. 10.120 (2) $\rightarrow$ 0.02
28. 49.588 (5) $\rightarrow$ 0.5
29. 25.116 (1) $\rightarrow$ 0.01
30. 30.797 (9) $\rightarrow$ 0.09
31. 15.503 (5) $\rightarrow$ 0.5
32. 47.538 (8) $\rightarrow$ 0.008
33. 28.899 (9) $\rightarrow$ 0.009
34. 4.113 (1) $\rightarrow$ 0.1
35. 31.059 (9) $\rightarrow$ 0.009
36. 14.370 (3) $\rightarrow$ 0.3
37. 20.452 (5) $\rightarrow$ 0.05
38. 42.520 (5) $\rightarrow$ 0.5
39. 1.492 (4) $\rightarrow$ 0.4
40. 28.353 (3) $\rightarrow$ 0.003
41. 16.703 (7) $\rightarrow$ 0.7
42. 34.222 (2) $\rightarrow$ 0.02
43. 21.117 (7) $\rightarrow$ 0.007
44. 24.654 (5) $\rightarrow$ 0.05
45. 65.836 (6) $\rightarrow$ 0.006

Decimal Place Value (continued)

What the digit is worth (continued)

46. 22.495 (4) $\rightarrow$ 0.4
47. 13.614 (1) $\rightarrow$ 0.01
48. 44.803 (8) $\rightarrow$ 0.8
49. 22.647 (7) $\rightarrow$ 0.007
50. 15.730 (7) $\rightarrow$ 0.7

Comparing Decimals

Compare decimals

1. $4.1 > 0.39$
2. $3.5 > 2.7$
3. $8.2 > 7.21$
4. $4.8 > 1.4$
5. $2.4 < 2.9$
6. $1.2 < 3.3$
7. $9.4 > 3.01$
8. $4.5 < 8.55$
9. $0.8 < 5.4$
10. $0.10 < 7.92$
11. $6.2 > 1.8$
12. $0.7 < 4.6$
13. $3.6 < 9.7$
14. $8.5 > 6.1$
15. $0.9 < 1.5$
16. $0.36 < 0.6$
17. $5.1 > 2.83$
18. $9.6 > 7.4$
19. $3.4 < 4.2$
20. $0.7 < 2.12$
21. $9.6 > 6.2$
22. $5.9 > 4.1$
23. $4.3 < 7.08$
24. $2.8 < 8.37$
25. $6.2 > 4.1$
26. $1.2 < 6.01$
27. $4.0 > 2.84$
28. $1.26 < 9.88$
29. $1.4 > 0.90$
30. $0.30 < 8.0$
31. $1.3 < 1.9$
32. $0.81 < 5.6$
33. $3.1 > 1.80$
34. $0.3 < 0.8$
35. $6.8 < 9.2$
36. $2.1 < 9.60$
37. $5.1 = 5.10$

Answer Key (2 of 9)

Comparing Decimals (continued)

Compare decimals (continued)

38. $9.5 > 8.1$
39. $3.4 < 9.01$
40. $0.7 < 7.0$
41. $0.29 < 2.32$
42. $2.28 < 7.9$
43. $2.6 < 6.4$
44. $3.5 > 2.80$
45. $6.7 < 7.95$
46. $2.0 > 0.2$
47. $0.44 < 9.5$
48. $6.3 > 3.44$
49. $0.8 < 4.78$
50. $1.6 > 1.51$

Multiplying and Dividing by 10, 100 and 1000

Multiply and divide by 10, 100, 1000

1. $0.29 \div 10 = 0.029$
2. $3.4 \div 1000 = 0.0034$
3. $6.54 \div 100 = 0.0654$
4. $4.3 \div 1000 = 0.0043$
5. $1.3 \div 1000 = 0.0013$
6. $1.6 \div 10 = 0.16$
7. $1.57 \div 100 = 0.0157$
8. $8.6 \div 100 = 0.086$
9. $6.8 \div 100 = 0.068$
10. $2.4 \div 100 = 0.024$
11. $1.6 \times 100 = 160$
12. $0.3 \div 1000 = 0.0003$
13. $9.3 \div 10 = 0.93$
14. $2.43 \div 10 = 0.243$
15. $2.9 \div 10 = 0.29$
16. $8.1 \div 10 = 0.81$
17. $1.4 \div 1000 = 0.0014$
18. $4.94 \times 100 = 494$
19. $1.3 \times 10 = 13$
20. $0.7 \div 10 = 0.07$
21. $1.89 \div 10 = 0.189$
22. $0.2 \times 100 = 20$
23. $0.15 \times 100 = 15$
24. $0.25 \div 10 = 0.025$
25. $3.68 \div 10 = 0.368$
26. $7.8 \div 1000 = 0.0078$
27. $2.2 \div 1000 = 0.0022$
28. $9.8 \times 10 = 98$
29. $4.9 \times 10 = 49$

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

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

30. $0.58 \div 1000 = 0.00058$
31. $0.04 \times 1000 = 40$
32. $4.8 \times 100 = 480$
33. $4.4 \times 10 = 44$
34. $0.1 \div 100 = 0.001$
35. $4.44 \div 10 = 0.444$
36. $0.5 \times 100 = 50$
37. $1.1 \div 10 = 0.11$
38. $1.3 \times 100 = 130$
39. $0.84 \div 1000 = 0.00084$
40. $0.44 \div 10 = 0.044$
41. $5.6 \div 10 = 0.56$
42. $4.22 \div 1000 = 0.00422$
43. $0.42 \div 100 = 0.0042$
44. $7.2 \div 1000 = 0.0072$
45. $1.75 \div 10 = 0.175$
46. $1.5 \div 100 = 0.015$
47. $0.6 \div 1000 = 0.0006$
48. $4.06 \times 10 = 40.6$
49. $6.7 \div 1000 = 0.0067$
50. $5.8 \div 10 = 0.58$

Adding and Subtracting Decimals

Add and subtract decimals

1. $18.74 - 15.87 = 2.87$
2. $6.67 - 3.81 = 2.86$
3. $3.24 + 6.02 = 9.26$
4. $17.30 - 10.67 = 6.63$
5. $0.38 + 4.29 = 4.67$
6. $18.57 - 10.78 = 7.79$
7. $9.02 + 6.64 = 15.66$
8. $2.77 + 2.94 = 5.71$
9. $15.07 - 11.29 = 3.78$
10. $9.87 - 3.68 = 6.19$
11. $1.92 + 7.76 = 9.68$
12. $3.43 - 1.09 = 2.34$
13. $7.74 - 0.75 = 6.99$
14. $6.95 + 8.11 = 15.06$
15. $14.59 - 6.63 = 7.96$
16. $12.88 - 6.76 = 6.12$
17. $6.08 - 5.20 = 0.88$
18. $9.48 + 7.06 = 16.54$
19. $6.49 - 3.26 = 3.23$
20. $12.92 - 8.23 = 4.69$
21. $10.00 - 0.02 = 9.98$

Answer Key (3 of 9)

Adding and Subtracting Decimals (continued)

Add and subtract decimals (continued)

22. $17.21 - 16.56 = 0.65$
23. $9.24 - 3.95 = 5.29$
24. $3.75 + 0.28 = 4.03$

What the digit is worth

25. 29.825 (8) $\rightarrow 0.8$
26. 29.609 (9) $\rightarrow 0.009$
27. 61.326 (3) $\rightarrow 0.3$
28. 17.994 (4) $\rightarrow 0.004$
29. 2.752 (7) $\rightarrow 0.7$
30. 5.401 (4) $\rightarrow 0.4$
31. 33.618 (1) $\rightarrow 0.01$
32. 1.946 (9) $\rightarrow 0.9$
33. 29.744 (4) $\rightarrow 0.004$
34. 27.923 (9) $\rightarrow 0.9$

Multiplying Decimals

Multiply and divide decimals

1. $8.9 \times 3 = 26.7$
2. $5.1 \times 3.6 = 18.36$
3. $1.91 \times 8.1 = 15.471$
4. $11.0 \times 4 = 44.0$
5. $1.3 \times 0.71 = 0.923$
6. $7.8 \times 6 = 46.8$
7. $9.03 \times 7 = 63.21$
8. $4.56 \times 0.2 = 0.912$
9. $11.8 \times 11 = 129.8$
10. $5.5 \times 1.1 = 6.05$
11. $7.18 \times 6 = 43.08$
12. $1.4 \times 10 = 14.0$
13. $2.9 \times 0.12 = 0.348$
14. $1.1 \times 5.38 = 5.918$
15. $7.5 \times 9 = 67.5$
16. $0.6 \times 8.1 = 4.86$
17. $0.67 \times 6 = 4.02$
18. $7.2 \times 2.13 = 15.336$
19. $0.16 \times 7.0 = 1.120$
20. $0.60 \times 3 = 1.80$
21. $1.90 \times 4.1 = 7.790$
22. $9.1 \times 6 = 54.6$
23. $1.7 \times 11 = 18.7$
24. $2.16 \times 5 = 10.80$
25. $4.89 \times 1.5 = 7.335$
26. $0.3 \times 10 = 3.0$
27. $5.5 \times 7 = 38.5$
28. $5.41 \times 4 = 21.64$

Multiplying Decimals (continued)

Multiply and divide decimals (continued)

29. $6.9 \times 0.25 = 1.725$
30. $8.51 \times 2 = 17.02$
31. $0.41 \times 3 = 1.23$
32. $3.31 \times 2.8 = 9.268$
33. $5.3 \times 12 = 63.6$
34. $11.0 \times 5 = 55.0$
35. $1.95 \times 12 = 23.40$
36. $3.9 \times 3 = 11.7$
37. $3.26 \times 5 = 16.30$
38. $6.82 \times 3 = 20.46$
39. $3.56 \times 5 = 17.80$
40. $3.74 \times 4 = 14.96$
41. $3.1 \times 3 = 9.3$
42. $0.37 \times 5.6 = 2.072$
43. $5.0 \times 2.6 = 13.00$
44. $4.2 \times 7 = 29.4$

Compare decimals

45. $0.20 < 5.7$
46. $2.8 > 1.3$
47. $9.8 > 9.62$
48. $5.0 = 5.0$
49. $0.9 < 6.7$
50. $1.8 < 9.2$
51. $1.26 < 9.88$
52. $4.2 < 7.4$
53. $4.6 > 3.5$
54. $5.1 > 2.83$

Multiplying Three Digits by Two

Multiply multi-digit numbers

1. $320 \times 18 = 5760$
2. $150 \times 11 = 1650$
3. $240 \times 98 = 23520$
4. $646 \times 24 = 15504$
5. $442 \times 19 = 8398$
6. $107 \times 96 = 10272$
7. $451 \times 41 = 18491$
8. $211 \times 14 = 2954$
9. $228 \times 59 = 13452$
10. $138 \times 65 = 8970$
11. $258 \times 82 = 21156$
12. $508 \times 30 = 15240$
13. $129 \times 69 = 8901$
14. $321 \times 69 = 22149$
15. $941 \times 12 = 11292$

Answer Key (4 of 9)

Multiplying Three Digits by Two (continued)

Multiply multi-digit numbers (continued)

16. $189 \times 34 = 6426$

Multiply and divide by 10, 100, 1000

17. $2.4 \div 100 = 0.024$

18. $0.3 \div 1000 = 0.0003$

19. $1.3 \times 100 = 130$

20. $3.5 \div 100 = 0.035$

21. $1.3 \times 10 = 13$

22. $2.8 \times 10 = 28$

23. $4.9 \times 100 = 490$

24. $0.44 \div 10 = 0.044$

25. $0.49 \div 100 = 0.0049$

26. $5.2 \div 1000 = 0.0052$

Long Division

Long division

1. $3431 \div 47 = 73$

2. $2839 \div 17 = 167$

3. $4628 \div 52 = 89$

4. $3051 \div 27 = 113$

5. $3456 \div 48 = 72$

6. $1472 \div 32 = 46$

7. $5875 \div 25 = 235$

8. $2730 \div 26 = 105$

9. $1444 \div 76 = 19$

10. $2030 \div 70 = 29$

Add and subtract decimals

11. $6.94 - 4.43 = 2.51$

12. $9.30 - 5.10 = 4.20$

13. $16.67 - 0.02 = 16.65$

14. $2.94 - 1.60 = 1.34$

15. $15.13 - 11.88 = 3.25$

16. $13.48 - 7.18 = 6.30$

17. $14.75 - 4.69 = 10.06$

18. $11.16 - 8.76 = 2.40$

19. $15.48 - 12.36 = 3.12$

20. $17.36 - 14.73 = 2.63$

Long Division with Remainders

Long division with remainders

1. $3319 \div 91 = 36 \text{ R } 43$

2. $1196 \div 98 = 12 \text{ R } 20$

3. $5639 \div 65 = 86 \text{ R } 49$

4. $2325 \div 89 = 26 \text{ R } 11$

5. $2835 \div 38 = 74 \text{ R } 23$

6. $1835 \div 91 = 20 \text{ R } 15$

Long Division with Remainders (continued)

Long division with remainders (continued)

7. $6795 \div 83 = 81 \text{ R } 72$

8. $1953 \div 72 = 27 \text{ R } 9$

9. $1467 \div 31 = 47 \text{ R } 10$

10. $2890 \div 33 = 87 \text{ R } 19$

Multiply and divide decimals

11. $5.5 \times 7 = 38.5$

12. $7.8 \times 6 = 46.8$

13. $7.48 \times 12 = 89.76$

14. $0.82 \times 3 = 2.46$

15. $0.75 \times 3 = 2.25$

16. $4.4 \times 4 = 17.6$

17. $0.37 \times 5.6 = 2.072$

18. $7.9 \times 11 = 86.9$

19. $0.60 \times 3 = 1.80$

20. $12.0 \times 9 = 108.0$

Equivalent Fractions

Equivalent fractions

1. $1/2 = 2/4$

2. $1/3 = 2/6$

3. $1/2 = 4/8$

4. $2/3 = 4/6$

5. $1/2 = 3/6$

6. $1/4 = 2/8$

7. $3/4 = 6/8$

Simplifying fractions

8. $2/6 = 1/3$

9. $3/6 = 1/2$

10. $6/8 = 3/4$

11. $4/6 = 2/3$

12. $2/4 = 1/2$

13. $4/8 = 1/2$

14. $2/8 = 1/4$

Multiply multi-digit numbers

15. $371 \times 31 = 11501$

16. $139 \times 75 = 10425$

17. $298 \times 82 = 24436$

18. $300 \times 53 = 15900$

19. $107 \times 62 = 6634$

20. $254 \times 35 = 8890$

21. $354 \times 52 = 18408$

22. $393 \times 14 = 5502$

Answer Key (5 of 9)

Multiplying Fractions

Multiplying fractions

1. $2/7 \times 2/3 = 4/21$
2. $7/8 \times 1/7 = 1/8$
3. $4/5 \times 3/5 = 12/25$
4. $3/8 \times 5/7 = 15/56$
5. $6/7 \times 6/7 = 36/49$
6. $7/8 \times 2/8 = 7/32$
7. $3/7 \times 6/7 = 18/49$
8. $3/8 \times 3/4 = 9/32$
9. $1/3 \times 1/2 = 1/6$
10. $1/8 \times 2/5 = 1/20$
11. $1/6 \times 5/6 = 5/36$
12. $1/8 \times 5/7 = 5/56$
13. $1/3 \times 2/4 = 1/6$
14. $4/7 \times 2/8 = 1/7$
15. $2/7 \times 3/8 = 3/28$
16. $4/6 \times 2/6 = 2/9$
17. $2/4 \times 6/8 = 3/8$
18. $2/8 \times 6/8 = 3/16$
19. $1/2 \times 5/6 = 5/12$
20. $1/4 \times 1/6 = 1/24$
21. $3/4 \times 2/7 = 3/14$
22. $6/8 \times 2/8 = 3/16$
23. $2/3 \times 3/8 = 1/4$
24. $4/7 \times 2/5 = 8/35$

Word problems: fractions

25. $4/6 + 1/6 = 5/6$ kilogram
26. $7/8 + 4/8 = 1 \frac{3}{8}$ cups
27. $8/12 - 5/12 = 1/4$ liter

Mixed Numbers

Adding mixed numbers

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

Mixed Numbers (continued)

Adding mixed numbers (continued)

15. $4 \frac{1}{4} + 4 \frac{1}{4} = 8 \frac{1}{2}$
16. $4 \frac{1}{7} + 3 \frac{4}{7} = 7 \frac{5}{7}$
17. $1 \frac{4}{7} + 5 \frac{1}{7} = 6 \frac{5}{7}$
18. $5 \frac{5}{6} + 5 \frac{5}{6} = 11 \frac{2}{3}$
19. $5 \frac{3}{5} + 5 \frac{1}{5} = 10 \frac{4}{5}$
20. $4 \frac{2}{7} + 2 \frac{2}{7} = 6 \frac{4}{7}$
21. $1 \frac{4}{5} + 1 \frac{2}{5} = 3 \frac{1}{5}$
22. $3 \frac{3}{7} + 1 \frac{1}{7} = 4 \frac{4}{7}$
23. $1 \frac{4}{7} + 1 \frac{1}{7} = 2 \frac{5}{7}$
24. $3 \frac{1}{6} + 1 \frac{1}{6} = 4 \frac{1}{3}$
25. $3 \frac{6}{7} + 4 \frac{1}{7} = 8$
26. $4 \frac{1}{5} + 2 \frac{3}{5} = 6 \frac{4}{5}$
27. $2 \frac{1}{5} + 4 \frac{3}{5} = 6 \frac{4}{5}$
28. $3 \frac{3}{5} + 2 \frac{2}{5} = 6$
29. $1 \frac{1}{4} + 5 \frac{1}{4} = 6 \frac{1}{2}$
30. $1 \frac{1}{5} + 5 \frac{3}{5} = 6 \frac{4}{5}$
31. $5 \frac{4}{7} + 5 \frac{2}{7} = 10 \frac{6}{7}$
32. $5 \frac{7}{8} + 5 \frac{3}{8} = 11 \frac{1}{4}$
33. $2 \frac{4}{7} + 2 \frac{2}{7} = 4 \frac{6}{7}$
34. $1 \frac{3}{5} + 4 \frac{1}{5} = 5 \frac{4}{5}$
35. $5 \frac{6}{7} + 5 \frac{5}{7} = 11 \frac{4}{7}$
36. $1 \frac{1}{5} + 3 \frac{3}{5} = 4 \frac{4}{5}$
37. $2 \frac{3}{8} + 4 \frac{1}{8} = 6 \frac{1}{2}$
38. $5 \frac{2}{5} + 2 \frac{4}{5} = 8 \frac{1}{5}$
39. $2 \frac{2}{5} + 2 \frac{2}{5} = 4 \frac{4}{5}$
40. $5 \frac{2}{7} + 3 \frac{2}{7} = 8 \frac{4}{7}$
41. $5 \frac{1}{8} + 2 \frac{5}{8} = 7 \frac{3}{4}$
42. $5 \frac{6}{7} + 1 \frac{2}{7} = 7 \frac{1}{7}$
43. $4 \frac{2}{5} + 5 \frac{1}{5} = 9 \frac{3}{5}$

Long division

44. $3690 \div 10 = 369$
45. $3010 \div 86 = 35$
46. $6880 \div 86 = 80$
47. $3696 \div 88 = 42$
48. $3132 \div 54 = 58$
49. $1860 \div 93 = 20$
50. $6111 \div 97 = 63$
51. $2700 \div 25 = 108$

Decimals as Fractions

Decimals as fractions

1. $0.75 = 3/4$
2. $0.6 = 3/5$
3. $0.375 = 3/8$
4. $0.25 = 1/4$

Answer Key (6 of 9)

Decimals as Fractions (continued)

Decimals as fractions (continued)

5. $0.2 = 1/5$
6. $0.8 = 4/5$
7. $0.625 = 5/8$
8. $0.5 = 1/2$
9. $0.4 = 2/5$
10. $0.125 = 1/8$
11. $0.875 = 7/8$

Simplifying fractions

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

Adding Unlike Fractions

Add and subtract fractions

1. $4/5 + 6/7 = 58/35$
2. $4/7 + 4/5 = 48/35$
3. $1/6 + 5/7 = 37/42$
4. $5/7 + 6/8 = 41/28$
5. $2/4 - 1/3 = 1/6$
6. $3/5 + 2/4 = 11/10$
7. $4/7 + 3/8 = 53/56$
8. $1/4 + 5/7 = 27/28$
9. $3/4 + 6/8 = 3/2$
10. $5/6 + 2/3 = 3/2$
11. $2/7 + 3/5 = 31/35$
12. $1/3 + 2/6 = 2/3$
13. $3/7 - 1/8 = 17/56$
14. $2/3 + 1/2 = 7/6$
15. $2/7 + 2/5 = 24/35$
16. $4/5 + 5/6 = 49/30$
17. $6/8 + 1/5 = 19/20$
18. $4/5 + 5/8 = 57/40$
19. $6/8 + 1/2 = 5/4$
20. $2/3 - 3/5 = 1/15$
21. $2/7 + 5/8 = 51/56$
22. $1/6 + 6/7 = 43/42$
23. $1/8 + 5/7 = 47/56$
24. $4/8 + 2/5 = 9/10$
25. $1/4 + 7/8 = 9/8$
26. $3/6 + 2/7 = 11/14$
27. $3/8 - 1/7 = 13/56$

Adding Unlike Fractions (continued)

Add and subtract fractions (continued)

28. $1/7 + 1/4 = 11/28$
29. $2/4 + 5/6 = 4/3$
30. $2/8 + 1/7 = 11/28$
31. $4/6 + 5/7 = 29/21$
32. $3/7 + 1/5 = 22/35$
33. $2/7 - 2/8 = 1/28$
34. $4/6 + 5/8 = 31/24$
35. $1/8 + 3/6 = 5/8$
36. $6/8 + 2/4 = 5/4$
37. $1/4 + 1/5 = 9/20$
38. $2/5 + 3/4 = 23/20$
39. $1/2 + 6/8 = 5/4$
40. $6/8 - 2/3 = 1/12$
41. $1/6 + 1/5 = 11/30$
42. $1/7 + 1/8 = 15/56$
43. $7/8 + 3/4 = 13/8$

Long division with remainders

44. $1046 \div 49 = 21 \text{ R } 17$
45. $3573 \div 13 = 274 \text{ R } 11$
46. $5848 \div 62 = 94 \text{ R } 20$
47. $1573 \div 24 = 65 \text{ R } 13$
48. $2715 \div 22 = 123 \text{ R } 9$
49. $1628 \div 93 = 17 \text{ R } 47$
50. $4427 \div 38 = 116 \text{ R } 19$
51. $3332 \div 32 = 104 \text{ R } 4$

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

Volume of Prisms

Volume of a rectangular prism

1. $8 \times 4 \times 5 + 4 \times 4 \times 4$: 224 cm³
2. $4 \times 3 \times 5 + 3 \times 3 \times 4$: 96 cm³
3. $6 \times 6 \times 4 + 5 \times 6 \times 4$: 264 cm³
4. $6 \times 3 \times 7 + 5 \times 3 \times 5$: 201 cm³
5. $4 \times 5 \times 8 + 3 \times 5 \times 3$: 205 cm³
6. $7 \times 3 \times 5 + 4 \times 3 \times 4$: 153 cm³
7. $6 \times 8 \times 5 + 3 \times 8 \times 4$: 336 cm³

Decimals as fractions

8. $0.4 = 2/5$
9. $0.6 = 3/5$
10. $0.375 = 3/8$
11. $0.8 = 4/5$
12. $0.2 = 1/5$
13. $0.5 = 1/2$
14. $0.125 = 1/8$

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. $(79 - 78) \times 8 = 8$
2. $4 \times (27 + 24) = 204$
3. $(74 + 94) \times 3 = 504$
4. $4 \times (81 - 71) = 40$
5. $(92 - 49) \times 3 = 129$
6. $4 \times (15 + 19) = 136$
7. $9 \times (40 + 31) = 639$
8. $(62 + 23) \times 2 = 170$
9. $6 \times (97 - 92) = 30$
10. $10 \times (65 - 55) = 100$
11. $9 \times (17 + 23) = 360$
12. $2 \times (59 + 26) = 170$
13. $2 \times (72 - 61) = 22$
14. $11 \times (93 - 61) = 352$
15. $(63 - 56) \times 4 = 28$
16. $(38 - 29) \times 9 = 81$
17. $(99 - 82) \times 6 = 102$
18. $(71 + 64) \times 3 = 405$
19. $(42 + 74) \times 2 = 232$
20. $2 \times (44 + 52) = 192$
21. $(26 + 27) \times 12 = 636$
22. $(41 - 20) \times 6 = 126$
23. $(53 + 30) \times 3 = 249$
24. $(37 + 21) \times 3 = 174$

Order of operations with larger numbers

25. $3 \times (814 - 672) = 426$
26. $6 \times (730 - 418) = 1872$
27. $(501 + 418) \times 6 = 5514$
28. $7 \times (856 - 494) = 2534$
29. $11 \times (959 - 857) = 1122$
30. $2 \times (415 + 349) = 1528$
31. $12 \times (966 - 524) = 5304$
32. $(822 - 821) \times 10 = 10$
33. $(668 + 528) \times 2 = 2392$

Order of Operations (continued)

Order of operations with larger numbers (continued)

34. $6 \times (171 + 115) = 1716$
35. $(940 - 104) \times 4 = 3344$
36. $(826 - 566) \times 2 = 520$
37. $(647 + 208) \times 3 = 2565$
38. $(582 + 160) \times 9 = 6678$
39. $9 \times (458 - 439) = 171$
40. $(108 + 399) \times 4 = 2028$

What the digit is worth

41. 12.986 (9) $\rightarrow 0.9$
42. 13.097 (9) $\rightarrow 0.09$
43. 32.193 (3) $\rightarrow 0.003$
44. 24.423 (2) $\rightarrow 0.02$
45. 16.151 (5) $\rightarrow 0.05$
46. 24.856 (8) $\rightarrow 0.8$
47. 49.748 (8) $\rightarrow 0.008$
48. 25.116 (1) $\rightarrow 0.01$
49. 19.448 (4) $\rightarrow 0.04$
50. 10.903 (3) $\rightarrow 0.003$

Two Patterns Together

Two rules, two patterns

1. Add 4 and add 8 $\rightarrow$ top row, term 2 = 8
2. Add 3 and add 9 $\rightarrow$ top row, term 3 = 9
3. Add 4 and add 16 $\rightarrow$ top row, term 2 = 8
4. Add 3 and add 6 $\rightarrow$ bottom row, term 4 = 24
5. Add 3 and add 12 $\rightarrow$ top row, term 3 = 9
6. Add 2 and add 10 $\rightarrow$ top row, term 2 = 4
7. Add 3 and add 12 $\rightarrow$ bottom row, term 3 = 36
8. Add 2 and add 8 $\rightarrow$ top row, term 4 = 8
9. Add 2 and add 12 $\rightarrow$ top row, term 3 = 6
10. Add 2 and add 4 $\rightarrow$ bottom row, term 4 = 16
11. Add 6 and add 18 $\rightarrow$ top row, term 3 = 18
12. Add 2 and add 10 $\rightarrow$ bottom row, term 3 = 30
13. Add 4 and add 8 $\rightarrow$ bottom row, term 4 = 32
14. Add 3 and add 15 $\rightarrow$ bottom row, term 4 = 60
15. Add 3 and add 6 $\rightarrow$ top row, term 2 = 6
16. Add 3 and add 6 $\rightarrow$ top row, term 4 = 12

Compare decimals

17. $3.3 < 8.16$
18. $1.8 < 9.2$
19. $8.7 > 4.4$
20. $4.8 > 2.85$
21. $2.1 < 9.60$
22. $2.9 < 7.08$
23. $1.35 < 9.6$

Answer Key (9 of 9)

Two Patterns Together (continued)

Compare decimals (continued)

24. $2.9 < 7.48$

25. $3.0 = 3.00$

26. $1.8 < 6.4$

Always, Sometimes or Never

Always, sometimes or never

1. A number that ends in 0 is even. → always
2. The sum of two even numbers is even. → always
3. An even number is bigger than an odd number. → sometimes
4. A number that ends in 5 is even. → never
5. You get the same answer whichever way round you multiply two numbers. → always
6. The product of two odd numbers is odd. → always
7. An odd number times an even number is odd. → never
8. A multiple of 10 is also a multiple of 5. → always

Solutions (1 of 16)

Decimal Place Value

What the digit is worth

1. $23.55\textcolor{red}{6} \rightarrow \underline{\hspace{2cm}}$

number: 2 3 . 5 5 $\textcolor{blue}{6}$
 6 $\rightarrow$ $\textcolor{blue}{0.006}$

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 thousandths.

Its VALUE is what it is worth there, not the digit itself: 6 in the thousandths is 0.006. That gap between "6" and "0.006" is the whole of this topic.

2. $5.\textcolor{red}{9}59 \rightarrow \underline{\hspace{2cm}}$

number: 5 . $\textcolor{blue}{9}$ 5 9
 9 $\rightarrow$ $\textcolor{blue}{0.9}$

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 9 sits in the tenths.

Its VALUE is what it is worth there, not the digit itself: 9 in the tenths is 0.9. That gap between "9" and "0.9" is the whole of this topic.

Comparing Decimals

Compare decimals

1. $4.1 \boxed{} 0.39$

4.10 ? 0.39
410 hundredths $\textcolor{blue}{>}$
39 hundredths
4.1 $\textcolor{blue}{>}$ 0.39

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. 4.1 is the same amount as 4.10 — a zero on the END of a decimal changes nothing.

Now they are both hundredths: 410 against 39. 410 is more. So $4.1 > 0.39$.

Solutions (2 of 16)

Comparing Decimals (continued)

Compare decimals (continued)

2. $3.5 \square 2.7$

$$\begin{array}{ccc} 3.5 & ? & 2.7 \\ 35 \text{ tenths} & > & 27 \text{ tenths} \\ 3.5 & > & 2.7 \end{array}$$

Both have 1 figure after the point already, so they are counting the same sized pieces.

Now they are both tenths: 35 against 27. 35 is more. So $3.5 > 2.7$.

Multiplying and Dividing by 10, 100 and 1000

Multiply and divide by 10, 100, 1000

1. $0.29 \div 10 = \underline{\hspace{2cm}}$

$$\begin{array}{ccc} 0.29 & \div & 10 \\ & & 0.029 \end{array}$$

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

$\div 10$ — every digit is worth a tenth as much, so the point steps one place left: 0.029. The digits never changed — only where the point sits. $0.29 \div 10 = 0.029$.

2. $3.4 \div 1000 = \underline{\hspace{2cm}}$

$$\begin{array}{ccc} 3.4 & \div & 1000 \\ & & 0.34 \\ & & 0.034 \\ & & 0.0034 \end{array}$$

1000 is $10 \times 10 \times 10$, so there are 3 moves to make — one for each ten.

$\div 10$ — every digit is worth a tenth as much, so the point steps one place left: 0.34.

And $\div 10$ again — every digit is worth a tenth as much, so the point steps one place left: 0.034.

And $\div 10$ again — every digit is worth a tenth as much, so the point steps one place left: 0.0034. The digits never changed — only where the point sits. $3.4 \div 1000 = 0.0034$.

Solutions (3 of 16)

Adding and Subtracting Decimals

Add and subtract decimals

1.

$$\begin{array}{r}
 7 16 14 \\
 1 \cancel{8} . \cancel{7} \cancel{4} \\
 1 5 . 8 7 \\
 \hline
 2 . 8 7
 \end{array}$$

$18.74 - 15.87$. 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 is too small to take 7 from, so a ten comes across from the left: this column now holds 14. $14 - 7 = 7$.

7 is too small to take 8 from, so a ten comes across from the left: this column now holds 16. $16 - 8 = 8$.

This column gave a ten to the right, so it is now 7, not 8. $7 - 5 = 2$.

1 take away 1 leaves nothing — and a nothing at the front is not written, so the answer starts one place along.

The point in the answer comes straight down from the ones above it — it was never moved, only lined up. $18.74 - 15.87 = 2.87$.

2.

$$\begin{array}{r}
 5 16 \\
 \cancel{6} . \cancel{6} 7 \\
 3 . 8 1 \\
 \hline
 2 . 8 6
 \end{array}$$

$6.67 - 3.81$. 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.

7 take away 1 leaves 6.

6 is too small to take 8 from, so a ten comes across from the left: this column now holds 16. $16 - 8 = 8$.

This column gave a ten to the right, so it is now 5, not 6. $5 - 3 = 2$.

The point in the answer comes straight down from the ones above it — it was never moved, only lined up. $6.67 - 3.81 = 2.86$.

Solutions (4 of 16)

Multiplying Decimals

Multiply and divide decimals

1. $8.9 \times 3 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 8.9 \times 3 \\ 89 \times 3 = 267 \\ 8.9 \rightarrow 1 \text{ figure} \\ 3 \rightarrow 0 \text{ figures} \\ 267 \quad 1 \text{ from the right} \\ 8.9 \times 3 = 26.7 \end{array}$$

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

$89 \times 3 = 267$. Ordinary times-tables, nothing decimal about it.

Now count the figures after the points in the QUESTION: 1 figure in 8.9 and 0 figures in 3 — 1 altogether.

So the answer gets 1 too. Count 1 in from the right of 267 and put the point there: 26.7.

2. $5.1 \times 3.6 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 5.1 \times 3.6 \\ 51 \times 36 = 1836 \\ 5.1 \rightarrow 1 \text{ figure} \\ 3.6 \rightarrow 1 \text{ figure} \\ 1836 \quad 2 \text{ from the right} \\ 5.1 \times 3.6 = 18.36 \end{array}$$

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

$51 \times 36 = 1836$. Ordinary times-tables, nothing decimal about it.

Now count the figures after the points in the QUESTION: 1 figure in 5.1 and 1 figure in 3.6 — 2 altogether.

So the answer gets 2 too. Count 2 in from the right of 1836 and put the point there: 18.36.

Multiplying Three Digits by Two

Multiply multi-digit numbers

1.

$$\begin{array}{r} 320 \\ \times 18 \\ \hline 2560 \\ 3200 \\ \hline 5760 \end{array}$$

320×18 , set out in columns. Split the 18 by place value and take one piece at a time.

The 8 is in the ones, so it is just 8: $320 \times 8 = 2560$.

The 1 is in the tens, so it is worth 10 — not 1. That is why this row is $320 \times 10 = 3200$, and why it ends in 0.

Now add the pieces: $2560 + 3200 = 5760$.

Solutions (5 of 16)

Multiplying Three Digits by Two (continued)

Multiply multi-digit numbers (continued)

2.

$$\begin{array}{r} 150 \\ \times 11 \\ \hline 150 \\ 1500 \\ \hline 1650 \end{array}$$

150×11 , set out in columns. Split the 11 by place value and take one piece at a time.

The 1 is in the ones, so it is just 1: $150 \times 1 = 150$.

The 1 is in the tens, so it is worth 10 — not 1. That is why this row is $150 \times 10 = 1500$, and why it ends in 0.

Now add the pieces: $150 + 1500 = 1650$.

Long Division

Long division

1.

$$\begin{array}{r} 73 \\ 47 \overline{)3431} \\ \underline{329} \\ 141 \\ \underline{141} \\ 0 \end{array}$$

3431 shared into groups of 47. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 47s fit into 343? 7 of them — write the 7 on top. $7 \times 47 = 329$, and $343 - 329$ leaves 14. Bring down the 1, which makes 141.

How many 47s fit into 141? 3 — write it on top. $3 \times 47 = 141$, and $141 - 141$ leaves 0.

Nothing is left to bring down and nothing is left over. $3431 \div 47 = 73$.

2.

$$\begin{array}{r} 167 \\ 17 \overline{)2839} \\ \underline{17} \\ 113 \\ \underline{102} \\ 119 \\ \underline{119} \\ 0 \end{array}$$

2839 shared into groups of 17. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 17s fit into 28? 1 of them — write the 1 on top. $1 \times 17 = 17$, and $28 - 17$ leaves 11. Bring down the 3, which makes 113.

How many 17s fit into 113? 6 — write it on top. $6 \times 17 = 102$, and $113 - 102$ leaves 11. Bring down the 9, which makes 119.

How many 17s fit into 119? 7 — write it on top. $7 \times 17 = 119$, and $119 - 119$ leaves 0.

Nothing is left to bring down and nothing is left over. $2839 \div 17 = 167$.

Solutions (6 of 16)

Long Division with Remainders

Long division with remainders

1.

$$\begin{array}{r} 36 \\ 91 \overline{) 3319} \\ \underline{273} \\ 589 \\ \underline{546} \\ 43 \end{array}$$

3319 shared into groups of 91. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 91s fit into 331? 3 of them — write the 3 on top. $3 \times 91 = 273$, and $331 - 273$ leaves 58. Bring down the 9, which makes 589.

How many 91s fit into 589? 6 — write it on top. $6 \times 91 = 546$, and $589 - 546$ leaves 43.

Nothing is left to bring down, and 43 is too small to divide again — so that is the remainder. $3319 \div 91 = 36$ remainder 43.

2.

$$\begin{array}{r} 12 \\ 98 \overline{) 1196} \\ \underline{98} \\ 216 \\ \underline{196} \\ 20 \end{array}$$

1196 shared into groups of 98. Long division starts at the LEFT — the other way round from adding.

Start at the left. How many 98s fit into 119? 1 of them — write the 1 on top. $1 \times 98 = 98$, and $119 - 98$ leaves 21. Bring down the 6, which makes 216.

How many 98s fit into 216? 2 — write it on top. $2 \times 98 = 196$, and $216 - 196$ leaves 20.

Nothing is left to bring down, and 20 is too small to divide again — so that is the remainder. $1196 \div 98 = 12$ remainder 20.

Equivalent Fractions

Equivalent fractions

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

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

$1/2$ 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 quarters: $4 \div 2 = 2$, 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: $1 \times 2 = 2$. $1/2 = 2/4$ — the same amount of cake, cut differently.

Solutions (7 of 16)

Equivalent Fractions (continued)

Equivalent fractions (continued)

2. $\frac{1}{3} = \frac{\quad}{6}$

$$\begin{array}{rclcl} \frac{1}{3} & = & \frac{?}{6} \\ 3 \times 2 & = & 6 \\ 1 \times 2 & = & 2 \\ \frac{1}{3} & = & \frac{2}{6} \end{array}$$

$\frac{1}{3}$ 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.

Thirds into sixths: $6 \div 3 = 2$, 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: $1 \times 2 = 2$. $\frac{1}{3} = \frac{2}{6}$ — the same amount of cake, cut differently.

Multiplying Fractions

Multiplying fractions

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

$$\begin{array}{l} \frac{2}{7} \times \frac{2}{3} \\ \text{top: } 2 \times 2 = 4 \\ \frac{2}{7} \times \frac{2}{3} = \frac{4}{21} \end{array}$$

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: $2 \times 2 = 4$.

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

2. $\frac{7}{8} \times \frac{1}{7} = \text{—}$

$$\begin{array}{l} \frac{7}{8} \times \frac{1}{7} \\ \text{top: } 7 \times 1 = 7 \\ \frac{7}{8} \times \frac{1}{7} = \frac{7}{56} \\ \frac{7}{56} = \frac{1}{8} \end{array}$$

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: $7 \times 1 = 7$.

Multiply the two bottom numbers: $8 \times 7 = 56$.

$\frac{7}{56}$ simplifies to $\frac{1}{8}$.

Solutions (8 of 16)

Multiplying Fractions (continued)

Word problems: fractions

25. Elena's recipe uses $\frac{4}{6}$ kilogram of rice for the dough and $\frac{1}{6}$ kilogram more for the topping.

How much rice does Elena need in all? ____

asked:

How much rice does Elena need in all?

$$\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$$

$\frac{5}{6}$ 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: $\frac{4}{6}$ and $\frac{1}{6}$. 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.

Parts of the same whole, put together — the pieces are already the same size, so they simply count up. So this one is an addition: $\frac{4}{6} + \frac{1}{6}$.

$\frac{4}{6} + \frac{1}{6} = \frac{5}{6}$ kilogram. And answer the question that was ASKED — "How much rice does Elena need in all?" — in kilogram, because the sum on its own is not yet an answer.

26. Courtney's recipe uses $\frac{7}{8}$ cup of flour for the dough and $\frac{4}{8}$ cup more for the topping.

How much flour does Courtney need in all? ____

asked:

How much flour does Courtney need in all?

$$\frac{7}{8} + \frac{4}{8} = 1 \frac{3}{8}$$

$1 \frac{3}{8}$ cups

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: $\frac{7}{8}$ and $\frac{4}{8}$. 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.

Parts of the same whole, put together — the pieces are already the same size, so they simply count up. So this one is an addition: $\frac{7}{8} + \frac{4}{8}$.

$\frac{7}{8} + \frac{4}{8} = 1 \frac{3}{8}$ cups. And answer the question that was ASKED — "How much flour does Courtney need in all?" — in cups, because the sum on its own is not yet an answer.

Solutions (9 of 16)

Mixed Numbers

Adding mixed numbers

1. $2\frac{3}{8} + 3\frac{1}{8} = \underline{\quad} \text{ — }$

$$\begin{array}{rclcl} \frac{3}{8} & + & \frac{1}{8} & = & \frac{4}{8} \\ 2 & + & 3 & = & 5 \\ & = & 5 & \frac{1}{2} \end{array}$$

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

The fractions go together first: $\frac{3}{8} + \frac{1}{8} = \frac{4}{8}$.

Then the wholes: $2 + 3 = 5$.

$\frac{4}{8}$ is the same amount as $\frac{1}{2}$ written in bigger pieces.

So the answer is $5\frac{1}{2}$.

2. $5\frac{1}{8} + 3\frac{1}{8} = \underline{\quad} \text{ — }$

$$\begin{array}{rclcl} \frac{1}{8} & + & \frac{1}{8} & = & \frac{2}{8} \\ 5 & + & 3 & = & 8 \\ & = & 8 & \frac{1}{4} \end{array}$$

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

The fractions go together first: $\frac{1}{8} + \frac{1}{8} = \frac{2}{8}$.

Then the wholes: $5 + 3 = 8$.

$\frac{2}{8}$ is the same amount as $\frac{1}{4}$ written in bigger pieces.

So the answer is $8\frac{1}{4}$.

Decimals as Fractions

Decimals as fractions

1. $0.75 \rightarrow \text{ — }$

$$\begin{array}{rclcl} 0.75 & = & \frac{75}{100} \\ 75 & \div & 25 & = & 3 \\ 100 & \div & 25 & = & 4 \\ \frac{75}{100} & = & \frac{3}{4} \end{array}$$

A decimal already IS a fraction — 0.75 is 75 hundredths. That is what the places after the point mean.

25 goes into both 75 and 100, so take it off both: $75 \div 25 = 3$ and $100 \div 25 = 4$. $\frac{75}{100}$ and $\frac{3}{4}$ are the same amount, and 4 is as far down as it goes.

Solutions (10 of 16)

Decimals as Fractions (continued)

Decimals as fractions (continued)

2. **0.6** → —

$$\begin{array}{rcl} 0.6 & = & \frac{6}{10} \\ 6 \div 2 & = & \mathbf{3} \\ 10 \div 2 & = & \mathbf{5} \\ \frac{6}{10} & = & \mathbf{\frac{3}{5}} \end{array}$$

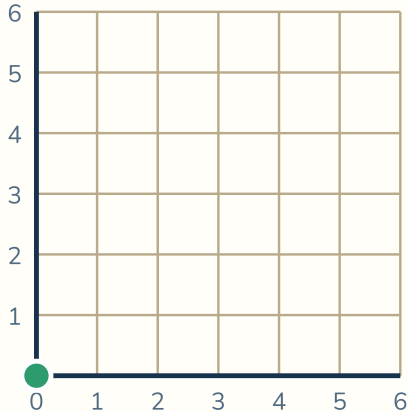
A decimal already IS a fraction — 0.6 is 6 tenths. That is what the places after the point mean.

2 goes into both 6 and 10, so take it off both: $6 \div 2 = 3$ and $10 \div 2 = 5$. $6/10$ and $3/5$ are the same amount, and 5 is as far down as it goes.

The Coordinate Plane

Points on a coordinate grid

1. **A** = —



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.

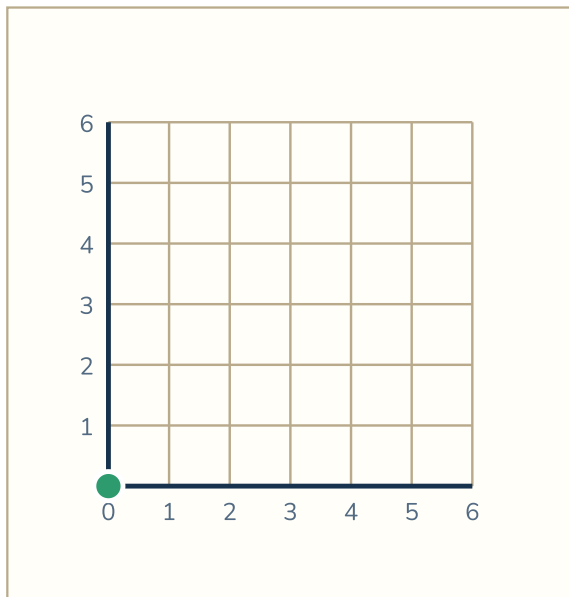
So point A is (0, 5). Swap the two round and you would be at (5, 0) — somewhere else entirely, which is why the order is the whole of this.

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.

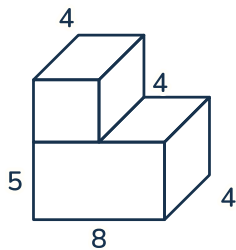
Then up: count 1. Now the two numbers have been used in the order they are written.

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

filled box: 288

notch: 64

$$288 - 64 = \text{224 cubic cm}$$

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 $8 \times 4 \times 5 = 160$, and the block standing on it is $4 \times 4 \times 4 = 64$.

$$160 + 64 = 224 \text{ cubic cm.}$$

Second way: fill the notch in to make one big box. That box is $8 \times 4 \times 9 = 288$, and the notch taken back off is $4 \times 4 \times 4 = 64$.

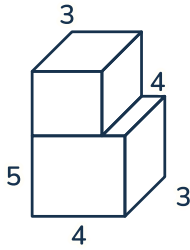
$288 - 64 = 224$ cubic cm. Two methods agreeing is how you know.

Solutions (12 of 16)

Volume of Prisms (continued)

Volume of a rectangular prism (continued)

2.



— cm³

filled box: 108

notch: 12

$$108 - 12 = \mathbf{96 \text{ cubic cm}}$$

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 $4 \times 3 \times 5 = 60$, and the block standing on it is $3 \times 3 \times 4 = 36$.

$$60 + 36 = 96 \text{ cubic cm.}$$

Second way: fill the notch in to make one big box. That box is $4 \times 3 \times 9 = 108$, and the notch taken back off is $1 \times 3 \times 4 = 12$.

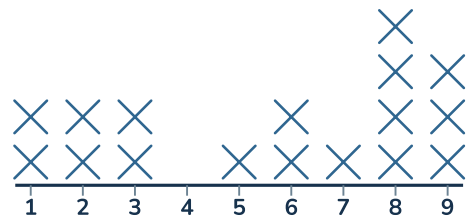
$108 - 12 = 96$ cubic cm. Two methods agreeing is how you know.

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.

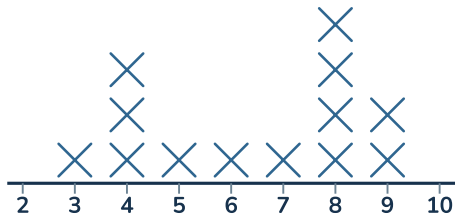
4 at 8 inches, 2 at 1 inch: $4 - 2 = 2$ — so the answer is 2.

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. $(79 - 78) \times 8 = \underline{\quad}$

$$\begin{array}{ccccccc} (& 79 & - & 78 &) & \times & 8 \\ & 1 & \times & 8 & & & \\ & & 8 & & & & \end{array}$$

Work inside the brackets first. $79 - 78 = 1$.

$\times$ and $\div$ come before $+$ and $-$, so this goes first. $1 \times 8 = 8$.

Nothing is left to work out, so the answer is 8.

2. $4 \times (27 + 24) = \underline{\quad}$

$$\begin{array}{ccccccc} 4 & \times & (& 27 & + & 24 &) \\ & & 4 & \times & 51 & & \\ & & & 204 & & & \end{array}$$

Work inside the brackets first. $27 + 24 = 51$.

$\times$ and $\div$ come before $+$ and $-$, so this goes first. $4 \times 51 = 204$.

Nothing is left to work out, so the answer is 204.

Solutions (15 of 16)

Two Patterns Together

Two rules, two patterns

1. **ADD 4**

ADD 8

4		12	16
8	16	24	32

row 1: 4 → 8
row 2: 8 → 16
row 3: 12 → 24
row 4: 16 → 32

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: 4 on the left, 8 on the right — that is $\times 2$.

The same link holds all the way down, so use it on the gap: $16 \div 2 = 8$.

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 3**

ADD 9

3	6		12
9	18	27	36

row 1: 3 → 9
row 2: 6 → 18
row 3: 9 → 27
row 4: 12 → 36

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, 9 on the right — that is $\times 3$.

The same link holds all the way down, so use it on the gap: $27 \div 3 = 9$.

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. A number that ends in 0 is even.

always

sometimes

never

Why?

always

sometimes

never

always

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.

There is no counter-example — it holds every time. So the answer is always.

2. The sum of two even numbers is even.

always

sometimes

never

Why?

always

sometimes

never

always

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.

There is no counter-example — it holds every time. So the answer is always.