Grade 3 Time, Shapes and Patterns Workbook

8 lessons · printable · answer key at the back

Name _____ Date _____

Contents

1-1

Number Patterns

WORKED EXAMPLE 3, 13, 23, 33 , 43

1. Number patterns

Find the missing number in each pattern.

1. 1, 9, 17, ___, 33
2. 6, 16, ___, 36, 46
3. 3, 13, ___, 33, 43
4. 8, ___, 20, 26, 32
5. 3, ___, 9, 12, 15
6. 8, 12, ___, 20, 24
7. 6, 11, 16, ___, 26
8. 8, 18, ___, 38, 48
9. 4, 8, ___, 16, 20
10. 3, 14, ___, 36, 47
11. 2, 6, 10, ___, 18
12. 3, 7, 11, ___, 19
13. 5, ___, 19, 26, 33
14. 3, 15, 27, ___, 51
15. 1, 8, ___, 22, 29
16. 9, ___, 31, 42, 53
17. 9, 12, 15, ___, 21
18. 4, 13, ___, 31, 40
19. 5, 13, ___, 29, 37
20. 8, 10, 12, ___, 16
21. 7, 15, 23, ___, 39
22. 8, 17, ___, 35, 44
23. 1, 4, 7, ___, 13
24. 3, 7, ___, 15, 19
25. 1, 3, 5, ___, 9
26. 2, ___, 12, 17, 22
27. 9, ___, 21, 27, 33
28. 6, 17, 28, ___, 50
29. 1, ___, 11, 16, 21
30. 6, ___, 14, 18, 22
31. 7, 10, ___, 16, 19
32. 4, ___, 24, 34, 44
33. 2, ___, 14, 20, 26
34. 9, 14, ___, 24, 29
35. 9, 20, 31, ___, 53
36. 2, ___, 10, 14, 18
37. 9, ___, 25, 33, 41
38. 4, 15, ___, 37, 48
39. 7, 11, ___, 19, 23
40. 3, ___, 17, 24, 31
41. 4, ___, 14, 19, 24
42. 5, 7, ___, 11, 13
43. 4, ___, 22, 31, 40
44. 7, ___, 11, 13, 15
45. 9, 21, 33, ___, 57
46. 2, 12, ___, 32, 42
47. 3, 6, ___, 12, 15
48. 7, 16, ___, 34, 43
49. 5, 9, 13, ___, 21
50. 6, ___, 30, 42, 54

2. Dividing by 7

Work out each quotient.

51. 7 ÷ 7 = ___
52. 14 ÷ 7 = ___
53. 35 ÷ 7 = ___
54. 28 ÷ 7 = ___
55. 21 ÷ 7 = ___
56. 42 ÷ 7 = ___
57. 63 ÷ 7 = ___
58. 49 ÷ 7 = ___
59. 70 ÷ 7 = ___
60. 56 ÷ 7 = ___

True, False or Fix It

WORKED EXAMPLE

Which number is the odd one out?

27 37 21 **58**

Why? ANSWER: the other three are all odd.

3. Reasoning puzzles

Read each question and write what you work out.

1 ■ + ■ = 26 and ■ + ● = 21. What is ●?

_____

Why? .....

2 ● + ● = 16 and ● + ◆ = 14. What is ◆?

_____

Why? .....

3 **Which number is the odd one out?**

7 24 9 36

Why? .....

4 **Ana wrote 11 − 4 = 13. Write the correct answer.**

_____

Why? .....

5 **Sam wrote 26 + 34 = 59. Write the correct answer.**

_____

Why? .....

6 **Which number is the odd one out?**

40 30 22 10

Why? .....

7 **Imani wrote 32 + 36 = 67. Write the correct answer.**

_____

Why? .....

Telling the Time

WORKED EXAMPLE

10:10 → 10:50 = 40 min

4. Elapsed time

Write how many minutes pass between the two times.

1 3:30 → 3:45 = ___ min

2 12:10 → 1:05 = ___ min

3 12:30 → 12:50 = ___ min

4 10:10 → 10:35 = ___ min

5 8:40 → 9:55 = ___ min

6 4:15 → 4:35 = ___ min

7 1:50 → 2:45 = ___ min

8 12:05 → 12:50 = ___ min

9 2:10 → 3:10 = ___ min

10 9:55 → 10:10 = ___ min

11 2:45 → 3:55 = ___ min

12 8:05 → 8:40 = ___ min

13 8:00 → 9:05 = ___ min

14 2:55 → 3:05 = ___ min

15 7:20 → 8:40 = ___ min

16 10:05 → 10:55 = ___ min

17 1:55 → 2:55 = ___ min

18 4:40 → 4:55 = ___ min

19 2:30 → 3:20 = ___ min

20 11:15 → 11:45 = ___ min

21 5:30 → 6:35 = ___ min

22 11:10 → 11:55 = ___ min

23 1:20 → 2:15 = ___ min

24 12:45 → 1:05 = ___ min

25 6:50 → 8:10 = ___ min

26 8:20 → 8:35 = ___ min

5. Comparing fractions

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

27 $\frac{4}{7}$ ◯ $\frac{1}{6}$

28 $\frac{6}{7}$ ◯ $\frac{4}{6}$

29 $\frac{4}{6}$ ◯ $\frac{4}{5}$

30 $\frac{2}{5}$ ◯ $\frac{1}{5}$

31 $\frac{4}{6}$ ◯ $\frac{3}{4}$

32 $\frac{4}{8}$ ◯ $\frac{1}{6}$

33 $\frac{5}{6}$ ◯ $\frac{2}{5}$

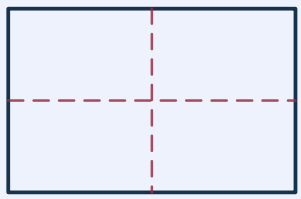
34 $\frac{4}{5}$ ◯ $\frac{5}{7}$

35 $\frac{2}{7}$ ◯ $\frac{4}{7}$

36 $\frac{3}{6}$ ◯ $\frac{4}{6}$

Naming Shapes

WORKED EXAMPLE

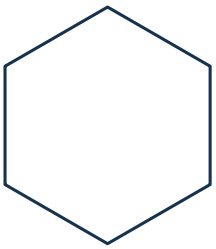


hexagon **rectangle** triangle

6. Name the shape

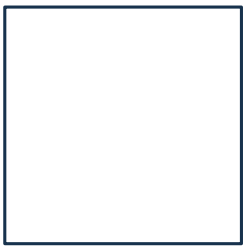
Circle the name of each shape.

1



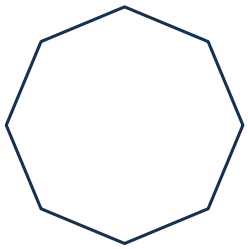
hexagon rectangle square

2



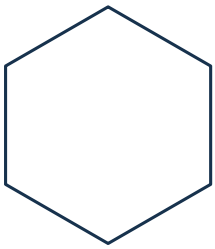
hexagon rectangle square

3



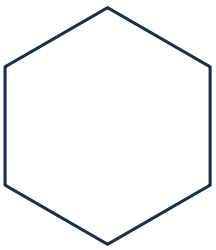
octagon pentagon triangle

4



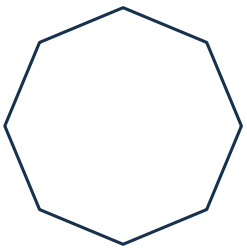
hexagon octagon rectangle

5



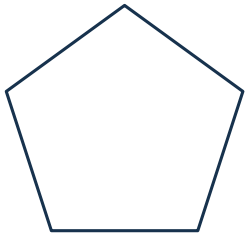
hexagon octagon triangle

6



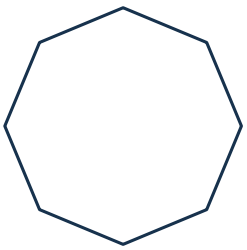
octagon pentagon square

7



pentagon rectangle triangle

8



octagon rectangle triangle

7. Number patterns

Find the missing number in each pattern.

9 **2, 9, ___, 23, 30**

10 **9, ___, 19, 24, 29**

11 **6, 16, ___, 36, 46**

12 **2, 9, 16, ___, 30**

13 **8, 10, ___, 14, 16**

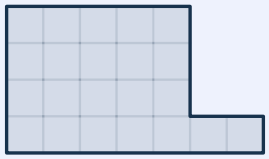
14 **5, 16, ___, 38, 49**

15 **8, 16, 24, ___, 40**

16 **7, ___, 17, 22, 27**

Area by Counting Squares

WORKED EXAMPLE

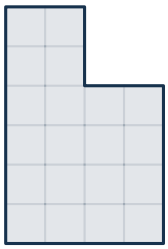


22 squares

8. Area by counting squares

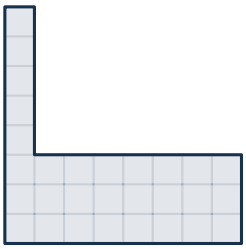
Count the squares to find the area of each figure.

1



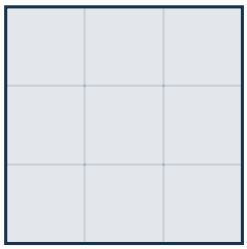
_____ squares

2



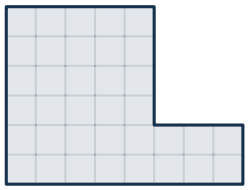
_____ squares

3



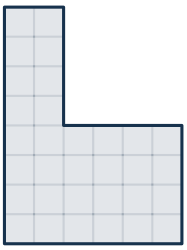
_____ squares

4



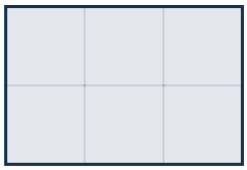
_____ squares

5



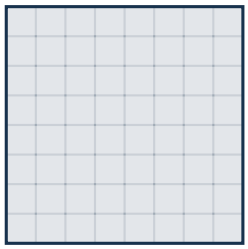
_____ squares

6



_____ squares

7

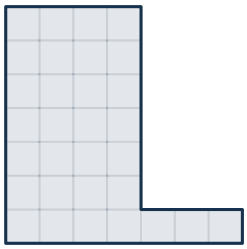


_____ squares

8

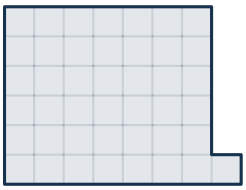
_____ squares

9



_____ squares

10



_____ squares

9. Rounding numbers

Round each number to the nearest 10.

11 **493** ≈ _____

12 **389** ≈ _____

13 **553** ≈ _____

14 **294** ≈ _____

15 **72** ≈ _____

16 **878** ≈ _____

17 **867** ≈ _____

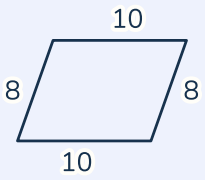
18 **87** ≈ _____

19 **302** ≈ _____

20 **947** ≈ _____

Perimeter

WORKED EXAMPLE

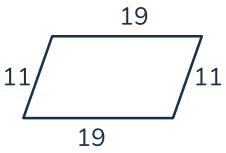


36 cm

10. Perimeter

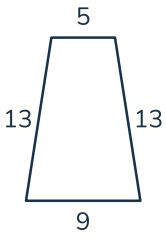
Add every side. All lengths are in centimeters.

1



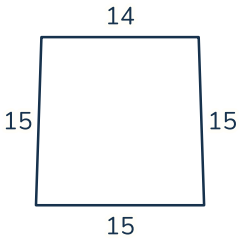
_____ cm

2



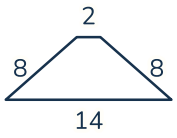
_____ cm

3



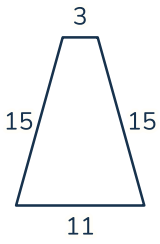
_____ cm

4



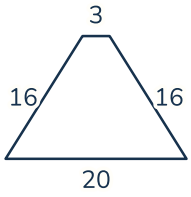
_____ cm

5



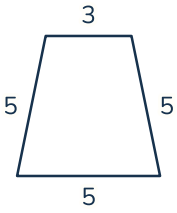
_____ cm

6



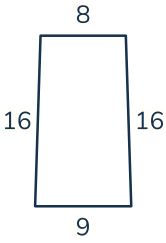
_____ cm

7



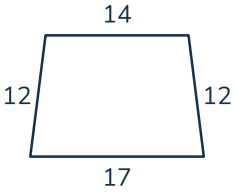
_____ cm

8



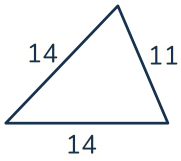
_____ cm

9



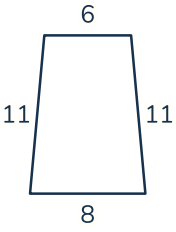
_____ cm

10



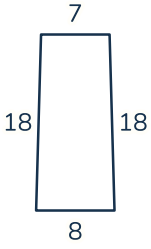
_____ cm

11



_____ cm

12



_____ cm

11. Elapsed time

Write how many minutes pass between the two times.

13 6:05 → 6:25 = ___ min

14 1:40 → 2:20 = ___ min

15 2:45 → 4:00 = ___ min

16 2:00 → 2:55 = ___ min

17 10:30 → 11:20 = ___ min

18 2:45 → 4:10 = ___ min

19 3:15 → 3:30 = ___ min

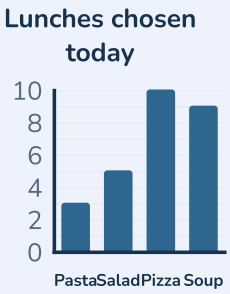
20 5:40 → 6:25 = ___ min

21 2:35 → 3:40 = ___ min

22 5:05 → 5:15 = ___ min

Bar Graphs and Line Plots

WORKED EXAMPLE

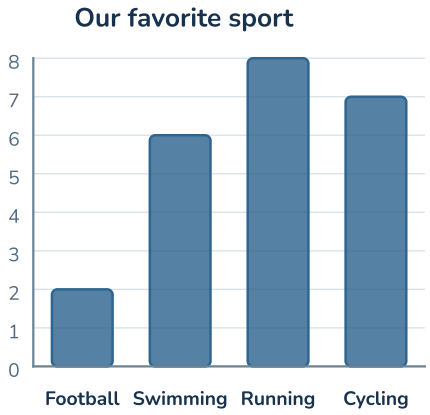


How many more chose salad and pizza than chose pasta?

12

12. Bar graphs

Read each bar graph and answer the question.



1 How many more chose swimming and running than chose football?

____

2 How many more chose football and swimming than chose cycling?

____

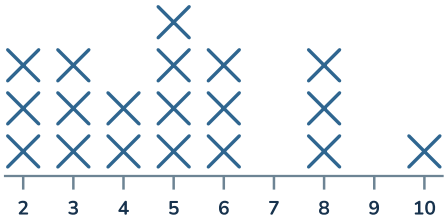
3 How many more chose football and running than chose swimming?

____

13. Line plots

Read each line plot and answer the question.

Length of worms we found (inches)



4 **How many worms were longer than 3 inches?**

____

5 **How many worms were longer than 4 inches?**

____

6 **How many worms were longer than 5 inches?**

____

Picture Graphs

WORKED EXAMPLE

Our favorite sport	
Football	●●
Swimming	●
Running	●●●●●●●●●●
Cycling	●●●●

Each ● stands for 1.

How many more chose swimming and running than chose football?

9

14. Picture graphs

Read each picture graph and answer the question.

Books read this term

Ali	●●●●●●●●●
Bea	●
Caz	●●●●●
Dev	●●●●●●●

Each ● stands for 1.

1 How many fewer for Bea than for Ali?

___

2 How many more for Ali than for Caz?

___

3 How many fewer for Dev than for Ali?

___

Lunches chosen today

Pasta	●●●●●●●●
Salad	●●●●●●●●●
Pizza	●●●●●●●●●●
Soup	●

Each ● stands for 1.

4 How many more chose salad and pizza than chose pasta?

___

5 How many more chose pasta and pizza than chose salad?

___

6 How many more chose pasta and salad than chose pizza?

___

15. Dividing by 7

Work out each quotient.

7 $49 \div 7 =$ ___

8 $14 \div 7 =$ ___

9 $70 \div 7 =$ ___

10 $42 \div 7 =$ ___

11 $63 \div 7 =$ ___

12 $35 \div 7 =$ ___

Answer Key (1 of 3)

Number Patterns

Number patterns

1. 1, 9, 17, [25], 33
2. 6, 16, [26], 36, 46
3. 3, 13, [23], 33, 43
4. 8, [14], 20, 26, 32
5. 3, [6], 9, 12, 15
6. 8, 12, [16], 20, 24
7. 6, 11, 16, [21], 26
8. 8, 18, [28], 38, 48
9. 4, 8, [12], 16, 20
10. 3, 14, [25], 36, 47
11. 2, 6, 10, [14], 18
12. 3, 7, 11, [15], 19
13. 5, [12], 19, 26, 33
14. 3, 15, 27, [39], 51
15. 1, 8, [15], 22, 29
16. 9, [20], 31, 42, 53
17. 9, 12, 15, [18], 21
18. 4, 13, [22], 31, 40
19. 5, 13, [21], 29, 37
20. 8, 10, 12, [14], 16
21. 7, 15, 23, [31], 39
22. 8, 17, [26], 35, 44
23. 1, 4, 7, [10], 13
24. 3, 7, [11], 15, 19
25. 1, 3, 5, [7], 9
26. 2, [7], 12, 17, 22
27. 9, [15], 21, 27, 33
28. 6, 17, 28, [39], 50
29. 1, [6], 11, 16, 21
30. 6, [10], 14, 18, 22
31. 7, 10, [13], 16, 19
32. 4, [14], 24, 34, 44
33. 2, [8], 14, 20, 26
34. 9, 14, [19], 24, 29
35. 9, 20, 31, [42], 53
36. 2, [6], 10, 14, 18
37. 9, [17], 25, 33, 41
38. 4, 15, [26], 37, 48
39. 7, 11, [15], 19, 23
40. 3, [10], 17, 24, 31
41. 4, [9], 14, 19, 24
42. 5, 7, [9], 11, 13
43. 4, [13], 22, 31, 40

Number Patterns (continued)

Number patterns (continued)

44. 7, [9], 11, 13, 15
45. 9, 21, 33, [45], 57
46. 2, 12, [22], 32, 42
47. 3, 6, [9], 12, 15
48. 7, 16, [25], 34, 43
49. 5, 9, 13, [17], 21
50. 6, [18], 30, 42, 54

Dividing by 7

51. 7 ÷ 7 = 1
52. 14 ÷ 7 = 2
53. 35 ÷ 7 = 5
54. 28 ÷ 7 = 4
55. 21 ÷ 7 = 3
56. 42 ÷ 7 = 6
57. 63 ÷ 7 = 9
58. 49 ÷ 7 = 7
59. 70 ÷ 7 = 10
60. 56 ÷ 7 = 8

True, False or Fix It

Reasoning puzzles

1. ■ = 13, ● = 8
2. ● = 8, ◆ = 6
3. 7, 24, 9, 36 → 7 (the other three are all multiples of 3)
4. 11 − 4 = 7, not 13 (each column took the smaller digit from the larger)
5. 26 + 34 = 60, not 59 (the answer is one out)
6. 40, 30, 22, 10 → 22 (the other three are all multiples of 10)
7. 32 + 36 = 68, not 67 (the answer is one out)

Telling the Time

Elapsed time

1. 3:30 → 3:45 = 15 min
2. 12:10 → 1:05 = 55 min
3. 12:30 → 12:50 = 20 min
4. 10:10 → 10:35 = 25 min
5. 8:40 → 9:55 = 75 min
6. 4:15 → 4:35 = 20 min
7. 1:50 → 2:45 = 55 min
8. 12:05 → 12:50 = 45 min
9. 2:10 → 3:10 = 60 min

Answer Key (2 of 3)

Telling the Time (continued)

Elapsed time (continued)

10. 9:55 → 10:10 = 15 min
11. 2:45 → 3:55 = 70 min
12. 8:05 → 8:40 = 35 min
13. 8:00 → 9:05 = 65 min
14. 2:55 → 3:05 = 10 min
15. 7:20 → 8:40 = 80 min
16. 10:05 → 10:55 = 50 min
17. 1:55 → 2:55 = 60 min
18. 4:40 → 4:55 = 15 min
19. 2:30 → 3:20 = 50 min
20. 11:15 → 11:45 = 30 min
21. 5:30 → 6:35 = 65 min
22. 11:10 → 11:55 = 45 min
23. 1:20 → 2:15 = 55 min
24. 12:45 → 1:05 = 20 min
25. 6:50 → 8:10 = 80 min
26. 8:20 → 8:35 = 15 min

Comparing fractions

27. 4/7 > 1/6
28. 6/7 > 4/6
29. 4/6 < 4/5
30. 2/5 > 1/5
31. 4/6 < 3/4
32. 4/8 > 1/6
33. 5/6 > 2/5
34. 4/5 > 5/7
35. 2/7 < 4/7
36. 3/6 < 4/6

Naming Shapes

Name the shape

1. hexagon — from hexagon, rectangle, square
2. square — from hexagon, rectangle, square
3. octagon — from octagon, pentagon, triangle
4. hexagon — from hexagon, octagon, rectangle
5. hexagon — from hexagon, octagon, triangle
6. octagon — from octagon, pentagon, square
7. pentagon — from pentagon, rectangle, triangle
8. octagon — from octagon, rectangle, triangle

Number patterns

9. 2, 9, [16], 23, 30
10. 9, [14], 19, 24, 29
11. 6, 16, [26], 36, 46

Naming Shapes (continued)

Number patterns (continued)

12. 2, 9, 16, [23], 30
13. 8, 10, [12], 14, 16
14. 5, 16, [27], 38, 49
15. 8, 16, 24, [32], 40
16. 7, [12], 17, 22, 27

Area by Counting Squares

Area by counting squares

1. 4×6 less 2×2: 20 squares
2. 8×8 less 7×5: 29 squares
3. 3×3: 9 squares
4. 8×6 less 3×4: 36 squares
5. 6×8 less 4×4: 32 squares
6. 3×2: 6 squares
7. 8×8: 64 squares
8. 6×3 less 3×1: 15 squares
9. 7×7 less 3×6: 31 squares
10. 8×6 less 1×5: 43 squares

Rounding numbers

11. 493 ≈ 490
12. 389 ≈ 390
13. 553 ≈ 550
14. 294 ≈ 290
15. 72 ≈ 70
16. 878 ≈ 880
17. 867 ≈ 870
18. 87 ≈ 90
19. 302 ≈ 300
20. 947 ≈ 950

Perimeter

Perimeter

1. parallelogram 19 + 11 + 19 + 11: 60 cm
2. trapezoid 5 + 13 + 9 + 13: 40 cm
3. trapezoid 14 + 15 + 15 + 15: 59 cm
4. trapezoid 2 + 8 + 14 + 8: 32 cm
5. trapezoid 3 + 15 + 11 + 15: 44 cm
6. trapezoid 3 + 16 + 20 + 16: 55 cm
7. trapezoid 3 + 5 + 5 + 5: 18 cm
8. trapezoid 8 + 16 + 9 + 16: 49 cm
9. trapezoid 14 + 12 + 17 + 12: 55 cm
10. triangle 11 + 14 + 14: 39 cm
11. trapezoid 6 + 11 + 8 + 11: 36 cm

Answer Key (3 of 3)

Perimeter (continued)

Perimeter (continued)

12. trapezoid 7 + 18 + 8 + 18: 51 cm

Elapsed time

13. 6:05 → 6:25 = 20 min
14. 1:40 → 2:20 = 40 min
15. 2:45 → 4:00 = 75 min
16. 2:00 → 2:55 = 55 min
17. 10:30 → 11:20 = 50 min
18. 2:45 → 4:10 = 85 min
19. 3:15 → 3:30 = 15 min
20. 5:40 → 6:25 = 45 min
21. 2:35 → 3:40 = 65 min
22. 5:05 → 5:15 = 10 min

Bar Graphs and Line Plots

Bar graphs

1. 6 + 8 = 14, 14 − 2 = 12
2. 2 + 6 = 8, 8 − 7 = 1
3. 2 + 8 = 10, 10 − 6 = 4

Line plots

4. longer than 3 inches — 13 worms
5. longer than 4 inches — 11 worms
6. longer than 5 inches — 7 worms

Picture Graphs

Picture graphs

1. Bea is 9 − 1 = 8 fewer than Ali
2. Ali is 9 − 5 = 4 more than Caz
3. Dev is 9 − 7 = 2 fewer than Ali
4. 9 + 10 = 19, 19 − 8 = 11
5. 8 + 10 = 18, 18 − 9 = 9
6. 8 + 9 = 17, 17 − 10 = 7

Dividing by 7

7. 49 ÷ 7 = 7
8. 14 ÷ 7 = 2
9. 70 ÷ 7 = 10
10. 42 ÷ 7 = 6
11. 63 ÷ 7 = 9
12. 35 ÷ 7 = 5

Solutions (1 of 11)

Number Patterns

Number patterns

1. **1, 9, 17, ___, 33**

1 9 17 **25** **33**

Find the rule first, from two numbers you can actually see — never from the gap.

1 to 9 is + 8. One pair is a guess, though — check it against another.

9 + 8 = 17, so the rule holds. Two pairs agreeing is what turns a guess into the rule.

Now apply it to the gap: 17 + 8 = 25.

Check it against the number already after the gap: 25 + 8 = 33, which is what is there. The missing number is 25.

2. **6, 16, ___, 36, 46**

6 16 **26** **36** 46

Find the rule first, from two numbers you can actually see — never from the gap.

6 to 16 is + 10. One pair is a guess, though — check it against another.

36 + 10 = 46, so the rule holds. Two pairs agreeing is what turns a guess into the rule.

Now apply it to the gap: 16 + 10 = 26.

Check it against the number already after the gap: 26 + 10 = 36, which is what is there. The missing number is 26.

Solutions (2 of 11)

True, False or Fix It

Reasoning puzzles

1. ■ + ■ = 26 and ■ + ● = 21. What is ●? ___

Why?

26	÷	2	=	13
21	–	13	=	**8**

Two unknown symbols and two facts. Do not start where the question points — start where there is only ONE thing you do not know, because that is the only place an answer can come from.

The first fact has the same symbol twice and nothing else, so it is that symbol doubled: half of 26 is 13.

Now the next fact has only one unknown left in it — it is 21 take away the 13: 21 – 13 = 8.

2. ● + ● = 16 and ● + ◆ = 14. What is ◆? ___

Why?

16	÷	2	=	8
14	–	8	=	**6**

Two unknown symbols and two facts. Do not start where the question points — start where there is only ONE thing you do not know, because that is the only place an answer can come from.

The first fact has the same symbol twice and nothing else, so it is that symbol doubled: half of 16 is 8.

Now the next fact has only one unknown left in it — it is 14 take away the 8: 14 – 8 = 6.

Telling the Time

Elapsed time

1. **3:30 → 3:45 = ___ min**

From 3:30 to 3:45. Count FORWARDS rather than taking one from the other — then nothing has to be borrowed and the hour never bites.

It all sits inside the one hour, so there is nothing to cross: 15 minutes straight through to 3:45.

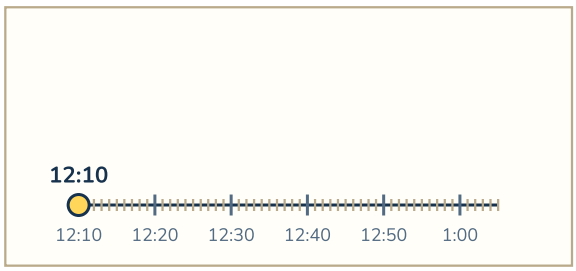
Add the hops up: 15 — that is 15 minutes.

Solutions (3 of 11)

Telling the Time (continued)

Elapsed time (continued)

2. **12:10 → 1:05 = ___ min**



From 12:10 to 1:05. Count FORWARDS rather than taking one from the other — then nothing has to be borrowed and the hour never bites.

First hop: up to the next o'clock. 12:10 to 1:00 is 50 minutes.

Then the last 5 minutes to reach 1:05.

Add the hops up: 50 + 5 — that is 55 minutes.

Comparing fractions

27. $\frac{4}{7} \bigcirc \frac{1}{6}$

$$\frac{4}{7} \;?\; \frac{1}{6}$$
$$\frac{4}{7} = \frac{24}{42}$$
$$\frac{1}{6} = \frac{7}{42}$$
$$\frac{24}{42} > \frac{7}{42}$$
$$\frac{4}{7} > \frac{1}{6}$$

Sevenths and sixths are different SIZES of piece, so the two top numbers cannot be compared as they stand. A bigger number on the bottom means a smaller piece — which is the part of this that feels backwards.

Cut both into 42ths: 4/7 is 24/42, and 1/6 is 7/42. Neither has changed in size — they are just being measured in the same piece now.

Same size of piece, so now it is only counting: 24 against 7. 4/7 is more than 1/6: 4/7 > 1/6.

28. $\frac{6}{7} \bigcirc \frac{4}{6}$

$$\frac{6}{7} \;?\; \frac{4}{6}$$
$$\frac{6}{7} = \frac{36}{42}$$
$$\frac{4}{6} = \frac{28}{42}$$
$$\frac{36}{42} > \frac{28}{42}$$
$$\frac{6}{7} > \frac{4}{6}$$

Sevenths and sixths are different SIZES of piece, so the two top numbers cannot be compared as they stand. A bigger number on the bottom means a smaller piece — which is the part of this that feels backwards.

Cut both into 42ths: 6/7 is 36/42, and 4/6 is 28/42. Neither has changed in size — they are just being measured in the same piece now.

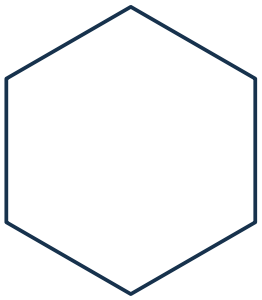
Same size of piece, so now it is only counting: 36 against 28. 6/7 is more than 4/6: 6/7 > 4/6.

Solutions (4 of 11)

Naming Shapes

Name the shape

1.



hexagon | rectangle | square

sides: 6

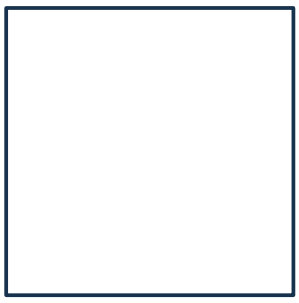
hexagon

Count the sides first — that is what almost every shape name is built from, and it is one number rather than a picture to recognize.

6 sides makes it a hexagon.

So it is a hexagon.

2.



hexagon | rectangle | square

square is also a rectangle (four right angles)

Count the sides first — that is what almost every shape name is built from, and it is one number rather than a picture to recognize.

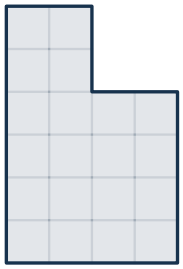
4 sides makes it a quadrilateral — and that is where naming gets more careful, because the four-sided shapes have families inside families.

This one is a square — and it is ALSO a rectangle (four right angles), and a rhombus (four equal sides), and a parallelogram. Being one does not stop it being the others; the question wants the most exact name that fits.

Solutions (5 of 11)

Area by Counting Squares

Area by counting squares

1. 

____ squares

first way: 24 − 4 = 20

strip: 4 × 4 = 16

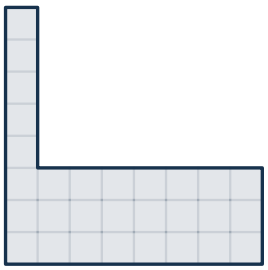
upright: 2 × 2 = 4

16 + 4 = **20 squares**

There is no single row that runs all the way across this one, so counting rows does not work as it stands. Cut it into pieces that ARE rectangles — and there is more than one way.

First way: count the whole rectangle it would be — 4 × 6 = 24 — then take off the bite, 2 × 2 = 4. That leaves 20.

Second way: two rectangles. The strip underneath is 4 × 4 = 16, the part standing on it is 2 × 2 = 4, and 16 + 4 = 20. Two ways agreeing is how you know a count is right.

2. 

____ squares

first way: 64 − 35 = 29

strip: 8 × 3 = 24

upright: 1 × 5 = 5

24 + 5 = **29 squares**

There is no single row that runs all the way across this one, so counting rows does not work as it stands. Cut it into pieces that ARE rectangles — and there is more than one way.

First way: count the whole rectangle it would be — 8 × 8 = 64 — then take off the bite, 7 × 5 = 35. That leaves 29.

Second way: two rectangles. The strip underneath is 8 × 3 = 24, the part standing on it is 1 × 5 = 5, and 24 + 5 = 29. Two ways agreeing is how you know a count is right.

Solutions (6 of 11)

Area by Counting Squares (continued)

Rounding numbers

11. **493 ≈ ____**

4	9	3
493	→	**490**

Find the tens digit first — that is the one that might change.

Now look at the single digit just after it: 3. Nothing further along matters at all.

3 is less than 5, so 493 is nearer 490 than 500. It stays down.

So 493 to the nearest ten is 490.

12. **389 ≈ ____**

3	8	9
389	→	**390**

Find the tens digit first — that is the one that might change.

Now look at the single digit just after it: 9. Nothing further along matters at all.

9 is 5 or more, so 389 is nearer 390 than 380. It rounds up.

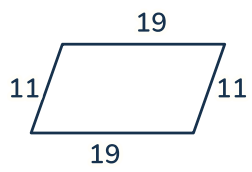
So 389 to the nearest ten is 390.

Solutions (7 of 11)

Perimeter

Perimeter

1.



___ cm

sides: 19 11 19 11

19 + 11 + 19 + 11 =

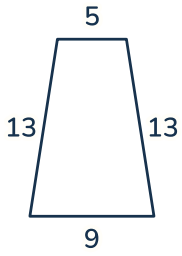
60 cm

Perimeter is the distance round the OUTSIDE — the length of the fence, not the size of the field. That is the whole difference between this and area, and it is where the usual wrong answer comes from.

So there is nothing to work out — just walk round the edge and add: 19 + 11 + 19 + 11.

19 + 11 + 19 + 11 = 60 cm. Note the unit: cm, not square cm — a fence is a length, and a length never gets squared.

2.



___ cm

sides: 5 13 9 13

5 + 13 + 9 + 13 =

40 cm

Perimeter is the distance round the OUTSIDE — the length of the fence, not the size of the field. That is the whole difference between this and area, and it is where the usual wrong answer comes from.

So there is nothing to work out — just walk round the edge and add: 5 + 13 + 9 + 13.

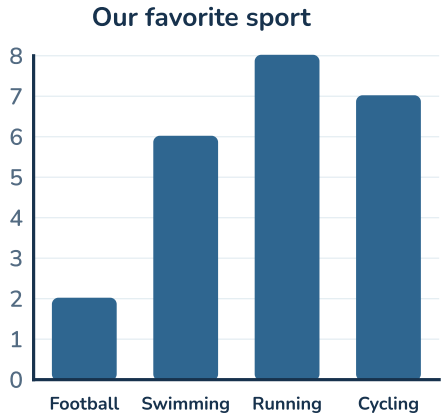
5 + 13 + 9 + 13 = 40 cm. Note the unit: cm, not square cm — a fence is a length, and a length never gets squared.

Solutions (8 of 11)

Bar Graphs and Line Plots

Bar graphs

1.



How many more chose swimming and running than chose football?

—

Football: 2 up → 2 votes

Swimming: 6 up → 6 votes

Running: 8 up → 8 votes

Cycling: 7 up → 7 votes

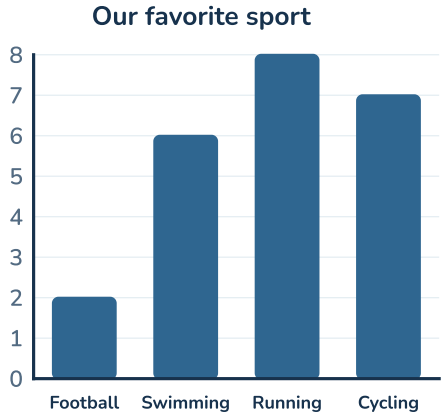
12 votes

Check the key first, every time. Here one square is one vote, so counting is enough — but that is a fact to check, not to assume.

So the counts read straight off: Football 2, Swimming 6, Running 8, Cycling 7.

Now the question, on the NUMBERS rather than the marks: 6 + 8 = 14, 14 − 2 = 12. So the answer is 12 votes.

2.



How many more chose football and swimming than chose cycling?

—

Football: 2 up → 2 votes

Swimming: 6 up → 6 votes

Running: 8 up → 8 votes

Cycling: 7 up → 7 votes

1 votes

Check the key first, every time. Here one square is one vote, so counting is enough — but that is a fact to check, not to assume.

So the counts read straight off: Football 2, Swimming 6, Running 8, Cycling 7.

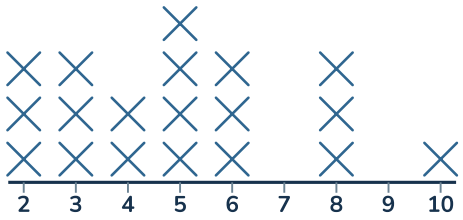
Now the question, on the NUMBERS rather than the marks: 2 + 6 = 8, 8 − 7 = 1. So the answer is 1 votes.

Solutions (9 of 11)

Bar Graphs and Line Plots (continued)

Line plots

4. **Length of worms we found (inches)**



How many worms were longer than 3 inches?

____

2 inches: 3 worms
3 inches: 3 worms
4 inches: 2 worms
5 inches: 4 worms
6 inches: 3 worms
8 inches: 3 worms
10 inches: 1 worms

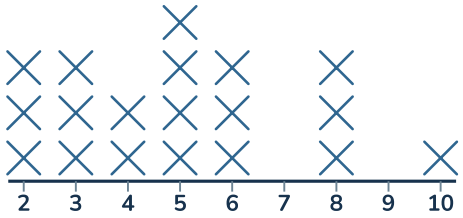
13

A line plot is not bars to read off a scale — each mark is one worm. 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: 3 at 2, 3 at 3, 2 at 4, 4 at 5, 3 at 6, 3 at 8, 1 at 10.

longer than 3 inches — 13 worms — so the answer is 13.

5. **Length of worms we found (inches)**



How many worms were longer than 4 inches?

____

2 inches: 3 worms
3 inches: 3 worms
4 inches: 2 worms
5 inches: 4 worms
6 inches: 3 worms
8 inches: 3 worms
10 inches: 1 worms

11

A line plot is not bars to read off a scale — each mark is one worm. 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: 3 at 2, 3 at 3, 2 at 4, 4 at 5, 3 at 6, 3 at 8, 1 at 10.

longer than 4 inches — 11 worms — so the answer is 11.

Solutions (10 of 11)

Picture Graphs

Picture graphs

1.

	Books read this term
Ali	●●●●●●●●●
Bea	●
Caz	●●●●●
Dev	●●●●●●●

Each ● stands for 1.

How many fewer for Bea than for Ali?

—

Ali: 9 drawn → **9 books**
Bea: 1 drawn → **1 books**
Caz: 5 drawn → 5 books
Dev: 7 drawn → 7 books

8 books

Check the key first, every time. Here one picture is one book, so counting is enough — but that is a fact to check, not to assume.

So the counts read straight off: Ali 9, Bea 1, Caz 5, Dev 7.

Now the question, on the NUMBERS rather than the marks: Bea is 9 − 1 = 8 fewer than Ali. So the answer is 8 books.

Solutions (11 of 11)

Picture Graphs (continued)

Picture graphs (continued)

2.

	Books read this term
Ali	●●●●●●●●●
Bea	●
Caz	●●●●●
Dev	●●●●●●●

Each ● stands for 1.

How many more for Ali than for Caz?

—

Ali: 9 drawn → **9 books**

Bea: 1 drawn → 1 books

Caz: 5 drawn → **5 books**

Dev: 7 drawn → 7 books

4 books

Check the key first, every time. Here one picture is one book, so counting is enough — but that is a fact to check, not to assume.

So the counts read straight off: Ali 9, Bea 1, Caz 5, Dev 7.

Now the question, on the NUMBERS rather than the marks: Ali is 9 – 5 = 4 more than Caz. So the answer is 4 books.