

Section 2

Quantitative Reasoning

38 Questions

Time: 35 minutes

Each question is followed by four suggested answers. Read each question and then decide which one of the four suggested answers is best.

Find the row of spaces on your answer document that has the same number as the question. In this row, mark the space having the same letter as the answer you have chosen. You may write in your test booklet.

EXAMPLE 1:

Sample Answer

What is the value of the expression $(4 + 6) \div 2$?

(A) (B) ● (D)

(A) 2

(B) 4

(C) 5

(D) 7

The correct answer is 5, so circle C is darkened.

EXAMPLE 2:

A square has an area of 25cm^2 . What is the length of one of its sides?

(A) ● (C) (D)

(A) 1 cm

(B) 5 cm

(C) 10 cm

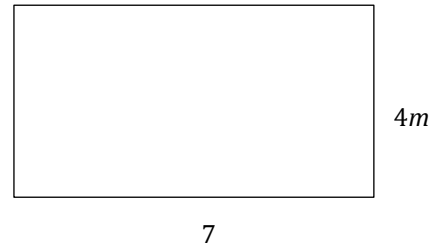
(D) 25 cm

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- Which is the largest fraction?
 - $\frac{3}{7}$
 - $\frac{4}{9}$
 - $\frac{5}{10}$
 - $\frac{6}{13}$
- Which is a value of x in the math equation $\frac{x}{4} + 14 = 16$?
 - $\frac{1}{2}$
 - 2
 - 8
 - 26
- A pencil costs \$1.03 and Alex wants to purchase 398 pencils. Which expression gives the best estimate of the total cost of Alex's purchase in dollars?
 - 1×40
 - 1×400
 - 10×390
 - 130×400
- Brianna has a drawer of socks with five different colors: purple, green, black, white, and pink. The probability of her choosing a white sock is 3 out of 7. Which combination of socks is possible?
 - 3 white socks and 7 other socks
 - 6 white socks and 14 other socks
 - 7 white socks and 21 other socks
 - 9 white socks and 12 other socks

- A rectangle and its length and width are shown below.



If the area of a rectangle is length \times width, what is the area of the rectangle above?

- $4 + 7$
 - 4×7
 - $4m \times 7$
 - $4m \times 7m$
- Which diagram represents the associative property?
 - $(\Delta + \boxtimes) = \Delta \boxtimes$
 - $(\Delta \boxtimes) \times \odot = \Delta \times (\boxtimes \odot)$
 - $\frac{\Delta}{\odot} = \frac{\odot}{\Delta}$
 - $\odot \frac{\Delta}{\boxtimes} = \frac{\odot \Delta}{\odot \boxtimes}$
 - The total combined cost of a hat, a pair of gloves, and a scarf is \$14.00. If the hat is twice as expensive as the scarf, and the pair of gloves costs one quarter of the cost of the hat, how much does the hat cost?
 - \$2
 - \$4
 - \$8
 - \$10

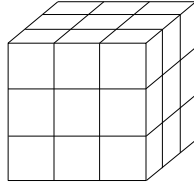
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8. Mrs. Montgomery's sewing kit contains 32 spools of thread: 8 black, 5 white, 6 brown, 4 red, and 2 blue. If she randomly selects a spool of thread without looking, which color has a 1 in 4 chance of being selected?
- (A) black
(B) white
(C) brown
(D) blue
9. The points with coordinates (2,4) (2,6) (7,4) (7,6) the vertices of which kind of quadrilateral?
- (A) square
(B) trapezoid
(C) hexagon
(D) rectangle
10. *All triangles have three sides. Equilateral triangles have sides of equal length.*
- Which of the following statements is true based on the information above?
- (A) All triangles have sides of equal length.
(B) All triangles are equilateral triangles.
(C) All equilateral triangles have three sides.
(D) If a shape does not have equal sides, it is not a triangle.

11. There are 48 students in a gym class. If there are 18 boys, what is the ratio of the number of girls to the total number of students in the gym class?
- (A) $\frac{3}{8}$
(B) $\frac{5}{8}$
(C) $\frac{5}{3}$
(D) $\frac{8}{3}$
12. The total number of big and small fish in a fish tank is represented by n . The number of big fish is represented by b and the number of small fish is represented by s . Which expression below represents the ratio of the big fish in the tank to the total number of fish?
- (A) $\frac{b}{n}$
(B) $\frac{b-s}{n}$
(C) $\frac{b}{s}$
(D) $\frac{b}{n-b}$
13. How many prime numbers are there between 1 and 16?
- (A) 4
(B) 6
(C) 8
(D) 9

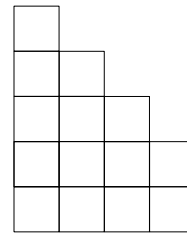
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14. If nine 1cm^3 unit cubes make up one side of a larger cube, how many unit cubes make up the entire larger cube?

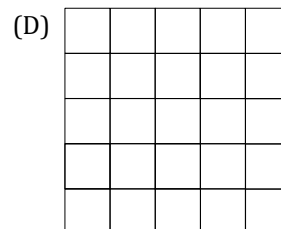
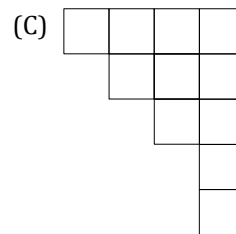
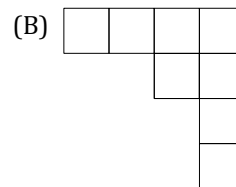
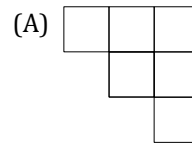


- (A) 15
 (B) 27
 (C) 38
 (D) 54
15. If 30 can be divided by both x and 5 without leaving a remainder, then 30 can also be divided by which of the following whole numbers without leaving a remainder?
- (A) $x \div 5$
 (B) x^2
 (C) $x + 5$
 (D) $x \times 5$

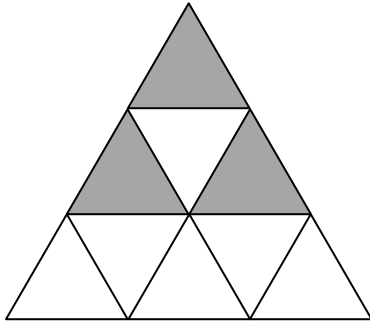
16. Use the diagram to answer the question.



Which piece would complete the diagram to make a square?



17. The larger triangle below is divided into small triangles.



If the area of the larger triangle is 9cm^2 , what is the area of the shaded region in cm^2 ?

- (A) $\frac{1}{3}$
- (B) 3
- (C) 6
- (D) 9

18. Use the equations below to answer the question.

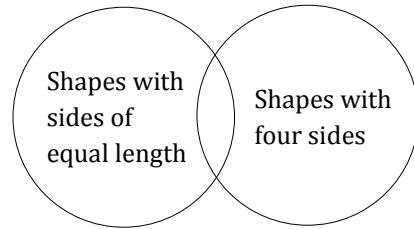
$$\diamond - 10 = 5$$

$$\bullet + 4 = 9$$

What is the value of $\diamond - \bullet$?

- (A) 25
- (B) 14
- (C) 10
- (D) 4

19. Use the Venn diagram to answer the question.



Which of the following shapes could be found in the center of the Venn diagram?

- (A) equilateral triangle
- (B) kite
- (C) parallelogram
- (D) square

20. Use the table to determine the rule.

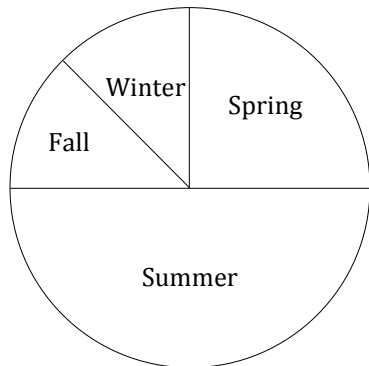
Input ■	Output Δ
1	3
4	9
9	19
15	31
17	35

What is the rule for the function?

- (A) $(\blacksquare \times 2) + 1 = \blacktriangle$
- (B) $\blacksquare \times 2 = \blacktriangle$
- (C) $\blacksquare + 1 = \blacktriangle$
- (D) $(\blacksquare \div 2) + 4 = \blacktriangle$

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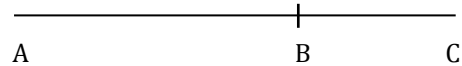
21. A survey of 50 students' favorite seasons is displayed in the circle graph shown.



About what fraction of the students chose either summer or winter as their favorite seasons?

- (A) $\frac{3}{8}$
 (B) $\frac{1}{2}$
 (C) $\frac{5}{8}$
 (D) $\frac{3}{4}$
22. Nitya has a map where 1.5 centimeters represents 2 city blocks. If her apartment is 7.5 centimeters away from the bus stop, what is this distance in city blocks?
- (A) 3
 (B) 6
 (C) 10
 (D) 15

23. Line segment AC is 9 centimeters long.



Point B is $\frac{2}{3}$ of the way from point A to point C . What is the length of line segment BC ?

- (A) 3 cm
 (B) 4.5 cm
 (C) 6 cm
 (D) 8.5 cm
24. Which of the following expressions has the same value as $3 \times \frac{4}{5}$?

- (A) $\frac{3+4}{5}$
 (B) $\frac{3 \times 4}{5}$
 (C) $\frac{4}{3 \times 5}$
 (D) $\frac{3 \times 4}{3 \times 5}$

25. Jack wrote down a whole number less than 19 and greater than 13. When Charlotte tried to guess the number, Jack told her it could only be divided by 1 and itself. What is Jack's number?

- (A) 15
 (B) 16.5
 (C) 17
 (D) 21

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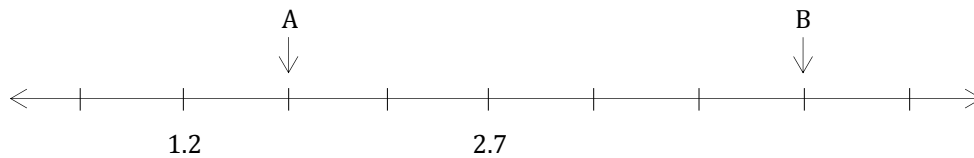
26. Nikolai conducted a survey of 10 random students at his school. He used the data to make the table below.

Student	Height (inches)	Weight (lbs)	Age (years)	???
1	65	132	13	?
2	52	75	10	?
3	56	90	12	?
4	61	122	11	?
5	61	103	15	?
6	67	152	14	?
7	59	101	13	?
8	54	82	12	?
9	58	93	10	?
10	60	142	11	?
Mean:	59.3	109.2	12.1	?

Which data could complete the last column of Nikolai's table?

- (A) the student's middle names
- (B) the students' eye colors
- (C) the students' favorite animals
- (D) how many siblings the students have

27. Use the number line to answer the question.

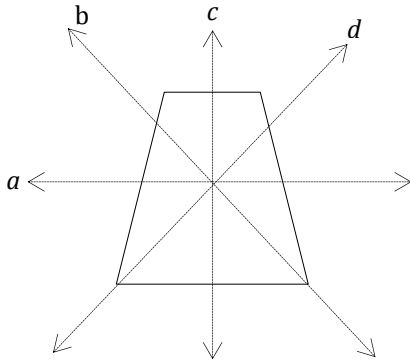


What is the sum of A and B ?

- (A) 1.7
- (B) 2.5
- (C) 4.3
- (D) 5.9

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28. The trapezoid shown below may be folded along the dotted lines.



Which line, when folded, will cause the sides of the trapezoid to overlap exactly?

- (A) line a
 (B) line b
 (C) line c
 (D) line d
29. 5 more than Mr. Leah's age is 2 less than four times his daughter's age. Which equation matches this relationship? Let L represent Mr. Leah's age and D represent his daughter's age.
- (A) $L + 5 = 2 - 4D$
 (B) $L + 5 = 4D - 2$
 (C) $L - 5 = \frac{1}{4}D + 2$
 (D) $L - 5 = 4D \div 2$
30. The first 5 terms of a sequence are shown below:

$1000, 100, 10, 1, 0.1$

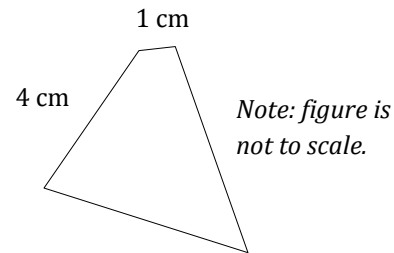
What is the 6th term of this sequence?

- (A) 1.0
 (B) 0.10
 (C) 0.01
 (D) 0.001

31. Tori cut pieces of ribbon to use for decoration. 1 piece of ribbon was $3\frac{1}{2}$ inches long, 2 pieces of ribbon were 2 inches long, and 1 piece of ribbon was $4\frac{1}{2}$ inches long. What was the mean length of the pieces of ribbon?

- (A) $2\frac{1}{2}$ inches
 (B) 3 inches
 (C) $3\frac{1}{2}$ inches
 (D) $3\frac{3}{4}$ inches

32. The perimeter of a quadrilateral is 18 centimeters.



Which of the following combinations could be the lengths of the two unknown sides?

- (A) 4 cm and 4 cm
 (B) 5 cm and 6 cm
 (C) 6 cm and 7 cm
 (D) 7 cm and 9 cm
33. Which story best fits the equation $48 \div 12 = 4$?
- (A) I have 12 books and 48 fit in each box. How many boxes do I need?
 (B) I have 60 boxes and 48 books. How many books will go in each box?
 (C) I have 48 books and 12 fit in each box. How many boxes do I need?
 (D) I have 48 books and my friend has 12 books. How many more books do I have?

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34. It takes Jane 10 minutes to ride her bike 2 miles. Corwin rides his bike twice as slowly. How many miles can Corwin ride in 1 hour and 15 minutes?

- (A) 5 miles
- (B) 7.5 miles
- (C) 9.5 miles
- (D) 15 miles

35. Samantha asked her friends to each bring some juice to her party so she could make punch. She added all of the juice to one bowl:

2 gallons apple juice

5.5 gallons grape juice

0.5 gallons grapefruit juice

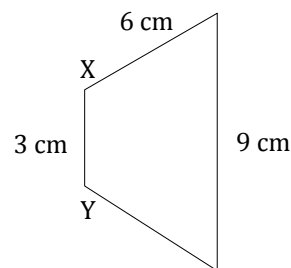
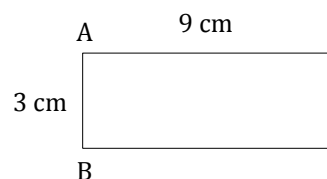
3 gallons orange juice

1 gallon pineapple juice

Then, she poured equal amounts into cups for her guests. How many gallons of punch will each of the 48 guests get to drink?

- (A) 4
- (B) 2
- (C) 0.75
- (D) 0.25

36. A rectangle (left) and a trapezoid (right) are shown with their side lengths below.



If the rectangle and trapezoid were joined along line segments AB and XY, what would be the perimeter of the resulting six-sided figure?

- (A) 27
- (B) 38
- (C) 42
- (D) 48

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37. The chart below shows the water levels in feet of two tanks over the course of four weeks.

	Tank 1	Tank 2
Start	120 ft	200 ft
1 week	130 ft	198 ft
2 week	140 ft	194 ft
3 week	150 ft	188 ft
4 week	160 ft	180 ft

According to the patterns from these data, how high will the water level of tank 2 be at week 6?

- (A) 150 ft
(B) 158 ft
(C) 160 ft
(D) 172 ft

38. Pete did the problem shown with his calculator.

$$\frac{60}{13} \times 145.5$$

Approximately what was his answer?

- (A) between 400 and 600
(B) between 600 and 800
(C) between 800 and 1000
(D) between 1000 and 1,200

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until told to do so.

