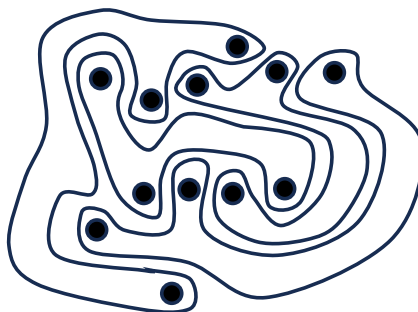


GRADES 1 AND 2

SAMPLE QUESTION FOR 3 POINTS

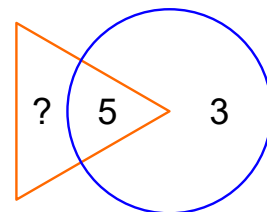
The picture shows 4 strange shapes. How many shapes have 3 dots inside?



- (A) 0 (B) 1 (C) 2 (D) 3 (E) 4

SAMPLE QUESTION FOR 4 POINTS

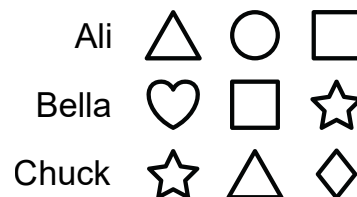
The sum of the numbers in the triangle should be twice the sum of the numbers in the circle. What number must replace the question mark?



- (A) 3 (B) 5 (C) 8 (D) 11 (E) 16

SAMPLE QUESTION FOR 5 POINTS

Ali, Bella, Chuck, and Dan each have 3 shapes. Each child has exactly one shape in common with each of the other children. Which shapes does Dan have?

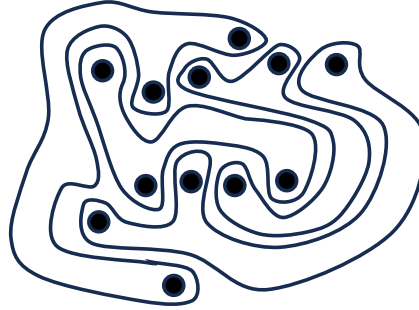


- (A) □ ♥ ◇ (B) ♥ ○ △
 (C) ☆ ◇ ○ (D) ◇ ○ ♥
 (E) □ ☆ △

GRADES 1 AND 2 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

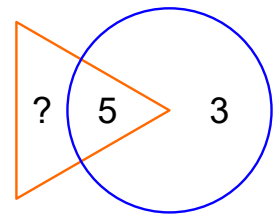
The picture shows 4 strange shapes. How many shapes have 3 dots inside?



- (A) 0 (B) 1 (C) 2 (D) 3 (E) 4

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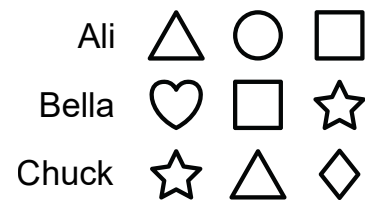
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- (A) □ ♥ ◇ (B) ♥ ○ △
 (C) ☆ ◇ ○ (D) ◇ ○ ♥
 (E) □ ☆ △

GRADES 3 AND 4



SAMPLE QUESTION FOR 3 POINTS


Justin wrote three consecutive 4-digit numbers in a row. His sister erased some digits. What are the missing digits (from left to right)? (For example, 213, 214, and 215 are three consecutive 3-digit numbers.)

 7, 898, 48

- (A) 389, 3, 99 (B) 489, 3, 96 (C) 489, 4, 98 (D) 489, 4, 99 (E) 488, 4, 99

SAMPLE QUESTION FOR 4 POINTS

There are five different kinds of fruit in a bowl:     .

Ann likes .






Ben likes     .

Cam likes   .

Dan likes  .

Eli likes  .

Everyone gets a fruit they like. Everyone gets a different kind of fruit. What does Ben get?

- (A)  (B)  (C)  (D)  (E) 

SAMPLE QUESTION FOR 5 POINTS

There are 60 students on a trip. When they line up, the colors of their reflective vests follow the pattern: yellow, green, yellow, green....

The colors of their backpacks follow a different pattern: red, brown, orange, red, brown, orange....

How many students with a yellow reflective vest also have an orange backpack?

- (A) 3 (B) 4 (C) 6 (D) 8 (E) 10

GRADES 3 AND 4 ANSWERS




SAMPLE QUESTION FOR 3 POINTS

Justin wrote three consecutive 4-digit numbers in a row. His sister erased some digits. What are the missing digits (from left to right)? (For example, 213, 214, and 215 are three consecutive 3-digit numbers.)

_ _ _7, _898, 48_ _

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There are 60 students on a trip. When they line up, the colors of their reflective vests follow the pattern: yellow, green, yellow, green....

The colors of their backpacks follow a different pattern: red, brown, orange, red, brown, orange....
How many students with a yellow reflective vest also have an orange backpack?

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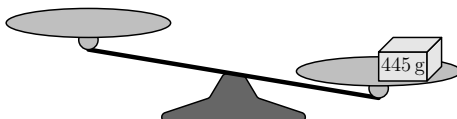
GRADES 5 AND 6

SAMPLE QUESTION FOR 3 POINTS

Peter has a package weighing 445 g and the following eight weights:



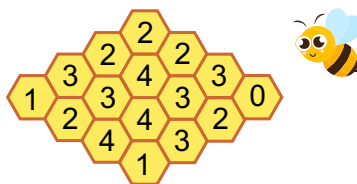
He puts the package on a scale, as shown. What is the smallest number of weights he needs to balance the scale?



- (A) 2
- (B) 3
- (C) 4
- (D) 5
- (E) 6

SAMPLE QUESTION FOR 4 POINTS

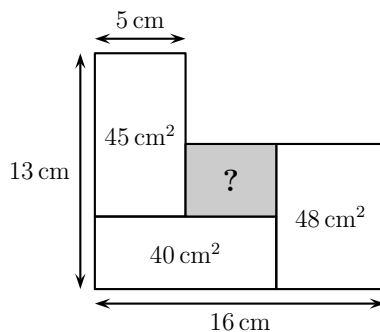
The figure below shows a honeycomb with 16 cells. Some of the cells contain honey. The number in each cell indicates how many of its neighboring cells contain honey. Two cells are neighbors if they share a common edge. How many cells in the honeycomb contain honey?



- (A) 7
- (B) 8
- (C) 9
- (D) 10
- (E) 11

SAMPLE QUESTION FOR 5 POINTS

The diagram shows four touching rectangles. What is the area of the shaded rectangle?



- (A) 12 cm²
- (B) 14 cm²
- (C) 16 cm²
- (D) 18 cm²
- (E) 20 cm²

GRADES 5 AND 6 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Peter has a package weighing 445 g and the following eight weights:



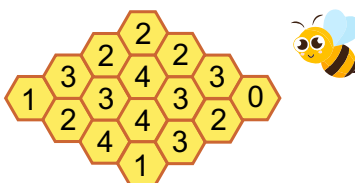
He puts the package on a scale, as shown. What is the smallest number of weights he needs to balance the scale?



- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6

SAMPLE QUESTION FOR 4 POINTS

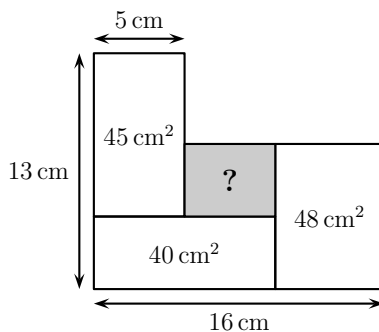
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- (A) 12 cm² (B) 14 cm² (C) 16 cm² (D) 18 cm² (E) 20 cm²

GRADES 7 AND 8

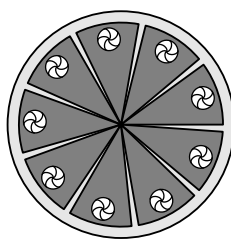
SAMPLE QUESTION FOR 3 POINTS

What is the value of $\frac{20 \times 24}{2 \times 0 + 2 \times 4}$?

- (A) 12 (B) 30 (C) 48 (D) 60 (E) 120

SAMPLE QUESTION FOR 4 POINTS

Carolina baked a cake and cut it into ten equal pieces. She ate one piece and then arranged the remaining pieces evenly, as shown. What is the measure of the angle between any two adjacent pieces?



- (A) 5° (B) 4° (C) 3° (D) 2° (E) 1°

SAMPLE QUESTION FOR 5 POINTS

Captain Flint asked four of his pirates to write on a piece of paper how many gold, silver, and bronze coins were in the treasure chest. Their responses are shown in the diagram but unfortunately part of the paper was damaged. Only one of the four pirates told the truth. The other three lied in all their answers. The total number of coins is 30. Who told the truth?

	Gold	Silver	Bronze
Tom		9	11
Al	7		12
Pit	10		10
Jim	9	10	

- (A) Tom (B) Al (C) Pit (D) Jim
 (E) We cannot be sure.

GRADES 7 AND 8 ANSWERS

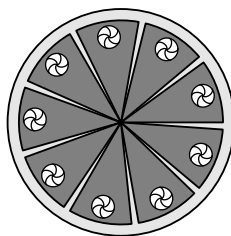
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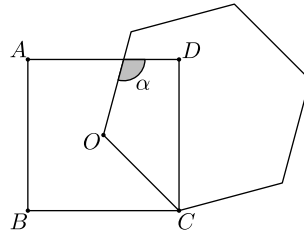
	Gold	Silver	Bronze
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Jim	9	10	

- (A) Tom (B) Al (C) Pit (D) Jim
(E) We cannot be sure.

GRADES 9 AND 10

SAMPLE QUESTION FOR 3 POINTS

Martin draws a square with vertices A , B , C , D and a regular hexagon with side OC , where O is the center of the square. What is the measure of angle α ?



- (A) 105° (B) 110° (C) 115° (D) 120° (E) 125°

SAMPLE QUESTION FOR 4 POINTS

There are four vases on the table. Sweets have been placed in the vases.
 The number of sweets in the first vase is the number of vases that contain exactly one sweet.
 The number of sweets in the second vase is equal to the number of vases that contain exactly two sweets.
 The number of sweets in the third vase is equal to the number of vases that contain exactly three sweets.
 The number of sweets in the fourth vase is equal to the number of vases that contain exactly zero sweets.
 How many sweets are in all the vases together?

- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6

SAMPLE QUESTION FOR 5 POINTS

The prime factorization of the number $n! = 1 \cdot 2 \cdot \dots \cdot n$ is of the form shown in the diagram.

$$2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13^4 \cdot 17 \cdot \text{[ink]} \cdot 43 \cdot 47$$

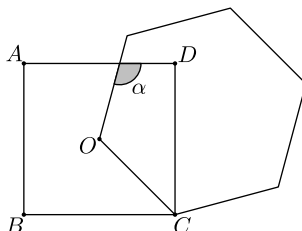
The primes are written in increasing order. Ink has covered some of the primes and some of the exponents. What is the exponent of 17?

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

GRADES 9 AND 10 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Martin draws a square with vertices A, B, C, D and a regular hexagon with side OC , where O is the center of the square. What is the measure of angle α ?



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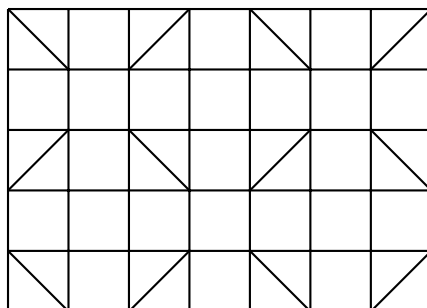
The primes are written in increasing order. Ink has covered some of the primes and some of the exponents. What is the exponent of 17?

- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

GRADES 11 AND 12

SAMPLE QUESTION FOR 3 POINTS

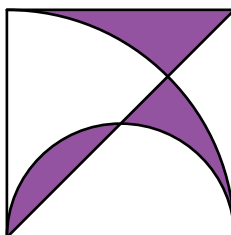
Beaver wishes to color the squares and triangles of the following figure so that no two neighboring shapes, even those sharing a single vertex, are the same color. What is the least number of colors he needs?



- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7

SAMPLE QUESTION FOR 4 POINTS

A diagonal, a semicircle, and a quarter-circle are drawn in a square of side 6 cm. What is the area, in cm^2 , of the shaded part?



- (A) 9 (B) 3π (C) $6\pi - 9$ (D) $\frac{10\pi}{3}$ (E) 12

SAMPLE QUESTION FOR 5 POINTS

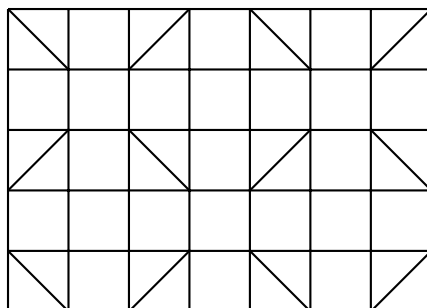
A special four-digit number \overline{abcd} satisfies the equation $\overline{abcd} = a^a + b^b + c^c + d^d$. What is the value of a ?

- (A) 2 (B) 3 (C) 4 (D) 5 (E) 6

GRADES 11 AND 12 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

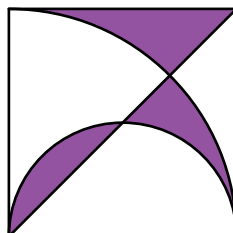
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