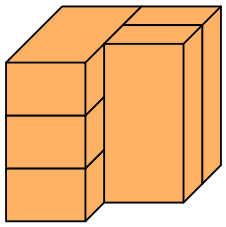
GRADES 1 AND 2

SAMPLE QUESTION FOR 3 POINTS



The picture shows 5 identical bricks.
How many bricks are touching exactly 3 other bricks?

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

SAMPLE QUESTION FOR 4 POINTS

Kanga wrote down a number and then covered each digit with a shape. She covered different digits by different shapes, and the same digits by the same shape. Which number could be under the shapes shown to the right?

(A) 34426 (B) 34526 (C) 34423 (D) 34424 (E) 32446

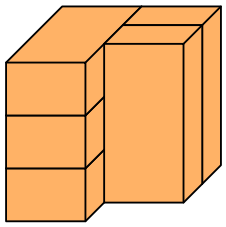
SAMPLE QUESTION FOR 5 POINTS

Each year, Maria receives teddy bears for her birthday. For her first birthday she received 1 teddy bear. For her second birthday she received 2 teddy bears. For each following birthday, she received one teddy bear more than the previous year. How many teddy bears does Maria have in total if she is 6 years old?

(A) 19 (B) 20 (C) 21 (D) 22 (E) 23

GRADES 1 AND 2 ANSWERS

SAMPLE QUESTION FOR 3 POINTS



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SAMPLE QUESTION FOR 4 POINTS

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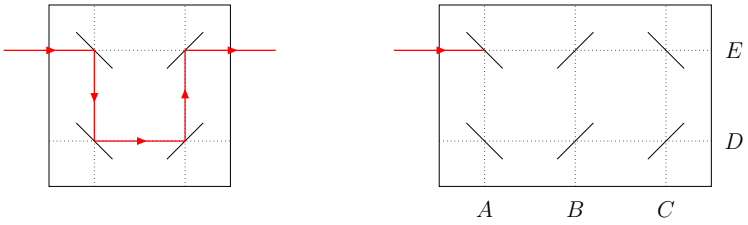
(A) 19 (B) 20 **(C) 21** (D) 22 (E) 23

GRADES 3 AND 4

SAMPLE QUESTION FOR 3 POINTS

Laser beams reflect in mirrors in the way shown in the first picture. At which letter will the laser beam in the second picture end?



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

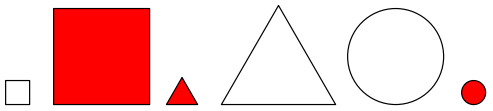
SAMPLE QUESTION FOR 4 POINTS

George wanted the sum of the three numbers in each row and in each column of the grid to be the same. He made one mistake. Which number must he correct?

9	1	5
3	7	6
4	7	4

(A) 1 (B) 3 (C) one of the 4s (D) 5 (E) one of the 7s

SAMPLE QUESTION FOR 5 POINTS

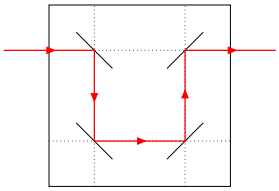
Wanda chose a few of the following shapes  and said, "Among the shapes I chose, there are 2 colored shapes, 2 large shapes, and 2 round shapes." What is the smallest number of shapes that Wanda could have chosen?

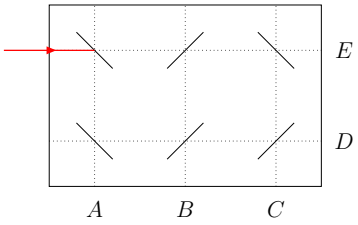
(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

GRADES 3 AND 4 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Laser beams reflect in mirrors in the way shown in the first picture. At which letter will the laser beam in the second picture end?





(A) A **(B) B** (C) C (D) D (E) E

SAMPLE QUESTION FOR 4 POINTS

George wanted the sum of the three numbers in each row and in each column of the grid to be the same. He made one mistake. Which number must he correct?

9	1	5
3	7	6
4	7	4

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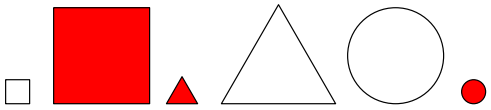
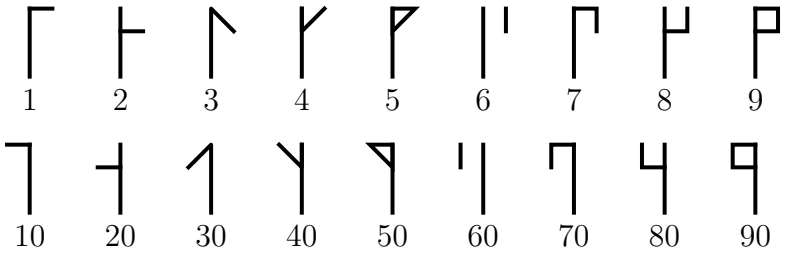
Wanda chose a few of the following shapes  and said, "Among the shapes I chose, there are 2 colored shapes, 2 large shapes, and 2 round shapes." What is the smallest number of shapes that Wanda could have chosen?

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

GRADES 5 AND 6

SAMPLE QUESTION FOR 3 POINTS

Cistercian numerals were used in the early thirteenth century. Any integer from 1 to 99 can be represented by a single glyph formed by combining two of the glyphs shown below.

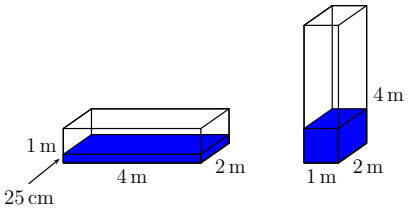


The glyph for 24 looks like  , the glyph for 81 looks like  , and the glyph for 93 looks like  . What does the glyph for 45 look like?

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

SAMPLE QUESTION FOR 4 POINTS

A water tank with a rectangular base has the dimensions 1 m×2 m×4 m. It contains water to a depth of 25 cm, as shown in the first picture. The tank is turned so that a 1 m × 2 m face becomes the base, as shown in the second picture. What is the depth of the water now?



(A) 25 cm (B) 50 cm (C) 75 cm (D) 1 m (E) 1.25 m

SAMPLE QUESTION FOR 5 POINTS

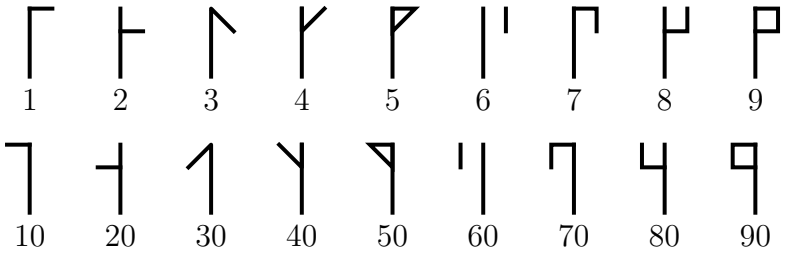
Some glasses are stacked on top of each other. A stack of 8 glasses is 42 cm high and a stack of 2 glasses is 18 cm high. How high is a stack of 6 glasses?

(A) 22 cm (B) 24 cm (C) 28 cm (D) 34 cm (E) 40 cm

GRADES 5 AND 6 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Cistercian numerals were used in the early thirteenth century. Any integer from 1 to 99 can be represented by a single glyph formed by combining two of the glyphs shown below.



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(A)  (B)  (C)  **(D)**  (E) 

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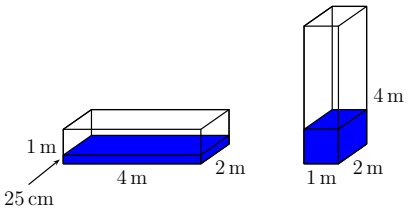

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(A) 22 cm (B) 24 cm (C) 28 cm **(D) 34 cm** (E) 40 cm

GRADES 7 AND 8

SAMPLE QUESTION FOR 3 POINTS

The license plate of Kangy's car fell off. He put it back upside down but luckily this didn't make any difference. Which of the following could be Kangy's license plate?

(A) **04 NSN 40** (B) **60 HOH 09** (C) **80 BNB 08**

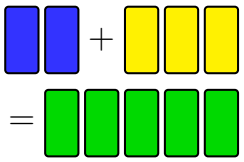
(D) **03 HNH 30** (E) **08 XBX 80**

SAMPLE QUESTION FOR 4 POINTS

In my office, there are two clocks. One clock gains one minute every hour and the other loses two minutes every hour. Yesterday I set them both to the correct time but when I looked at them today, I saw that the time shown on one was 11:00 a.m. and shown on the other was 12:00 noon. What time was it when I set the two clocks?

(A) 11:00 p.m. (B) 7:40 p.m. (C) 3:40 p.m. (D) 2:00 p.m. (E) 11:20 a.m.

SAMPLE QUESTION FOR 5 POINTS



A painter wanted to mix 2 liters of blue paint with 3 liters of yellow paint to make 5 liters of green paint. However, by mistake he used 3 liters of blue and 2 liters of yellow so that he made the wrong shade of green. What is the smallest amount of this green paint that he must throw away so that, using the rest of his green paint and some extra blue and/or yellow paint, he could make 5 liters of paint of the correct shade of green?

(A) $\frac{5}{3}$ liters (B) $\frac{3}{2}$ liters (C) $\frac{2}{3}$ liters (D) $\frac{3}{5}$ liters (E) $\frac{5}{9}$ liters

GRADES 7 AND 8 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

The license plate of Kangy's car fell off. He put it back upside down but luckily this didn't make any difference. Which of the following could be Kangy's license plate?

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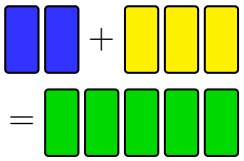
A painter wanted to mix 2 liters of blue paint with 3 liters of yellow paint to make 5 liters of green paint. However, by mistake he used 3 liters of blue and 2 liters of yellow so that he made the wrong shade of green. What is the smallest amount of this green paint that he must throw away so that, using the rest of his green paint and some extra blue and/or yellow paint, he could make 5 liters of paint of the correct shade of green?

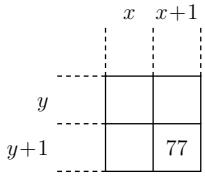


(A) $\frac{5}{3}$ liters (B) $\frac{3}{2}$ liters (C) $\frac{2}{3}$ liters (D) $\frac{3}{5}$ liters (E) $\frac{5}{9}$ liters

GRADES 9 AND 10

SAMPLE QUESTION FOR 3 POINTS

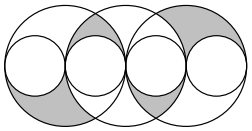
A square of numbers is taken out from a multiplication table. Only one number is visible. The integers x and y are both positive and x is greater than y. What is the value of x?



(A) 6 (B) 7 (C) 8 (D) 10 (E) 11

SAMPLE QUESTION FOR 4 POINTS

The diagram shows three large circles of equal radius and four small circles of equal radius where the centers of all circles and all points of contact lie on one straight line. The radius of each small circle is 1. What is the shaded area?



(A) π (B) 2π (C) 3π (D) 4π (E) 6π

SAMPLE QUESTION FOR 5 POINTS

A group of pirates divided 200 gold coins and 600 silver coins between them. Each officer received 5 gold and 10 silver coins. Each sailor received 3 gold and 8 silver coins. Each cabin boy received 1 gold and 6 silver coins. How many pirates are there in the group?

(A) 50 (B) 60 (C) 72 (D) 80 (E) 90

GRADES 9 AND 10 ANSWERS

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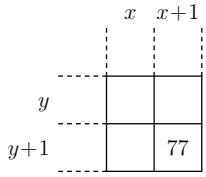

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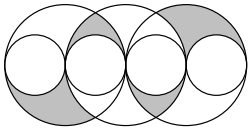

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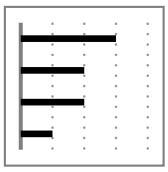
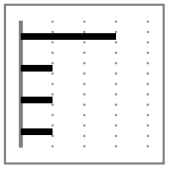
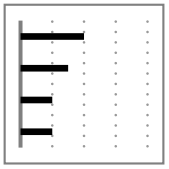
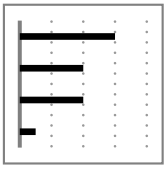
GRADES 11 AND 12

SAMPLE QUESTION FOR 3 POINTS

On Henry's smartphone, the diagram shows how much time he spent last week on each of his apps. The apps are ordered from the most to the least time spent. This week, he spent exactly the same amount of time as last week on two of his apps, but only half as much time on the other two. Which of the diagrams below cannot be the diagram for this week?



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

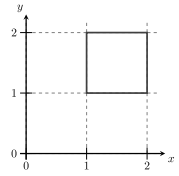
SAMPLE QUESTION FOR 4 POINTS

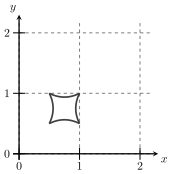
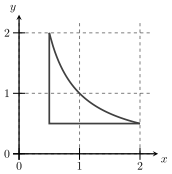
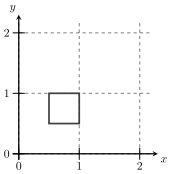
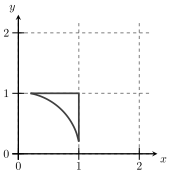
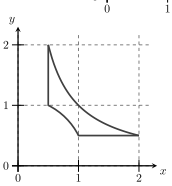
What is the greatest common divisor of $2^{2021} + 2^{2022}$ and $3^{2021} + 3^{2022}$?

(A) 2^{2021} (B) 1 (C) 2 (D) 6 (E) 12

SAMPLE QUESTION FOR 5 POINTS

A square lies in a coordinate system as shown. Each point (x, y) on the square is moved to $\left(\frac{1}{x}, \frac{1}{y}\right)$. What will the resulting figure look like?



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

GRADES 11 AND 12 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

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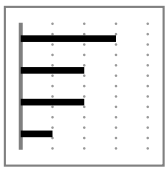
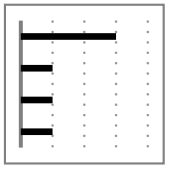
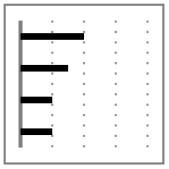
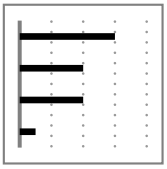


(A)  (B)  (C)  (D)  **(E)** 

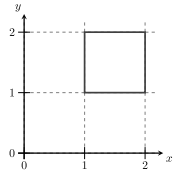
SAMPLE QUESTION FOR 4 POINTS

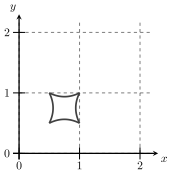
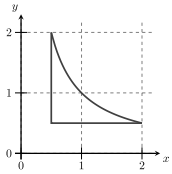
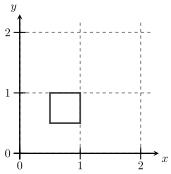
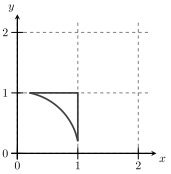
What is the greatest common divisor of $2^{2021} + 2^{2022}$ and $3^{2021} + 3^{2022}$?

(A) 2^{2021} (B) 1 (C) 2 (D) 6 **(E) 12**

SAMPLE QUESTION FOR 5 POINTS

A square lies in a coordinate system as shown. Each point (x, y) on the square is moved to $\left(\frac{1}{x}, \frac{1}{y}\right)$. What will the resulting figure look like?



(A)  (B)  **(C)**  (D)  (E)