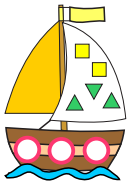
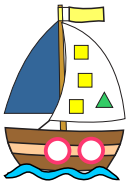
GRADES 1 AND 2

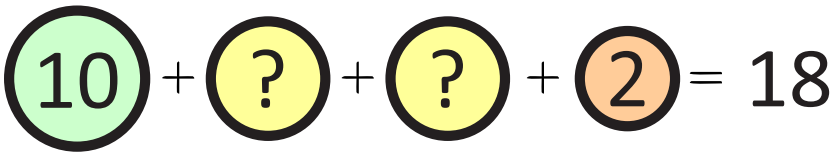
SAMPLE QUESTION FOR 3 POINTS

My boat has more than 1 circle. It also has 2 more triangles than squares. Which boat is mine?

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

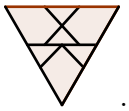
SAMPLE QUESTION FOR 4 POINTS

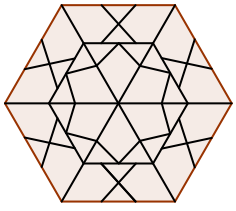
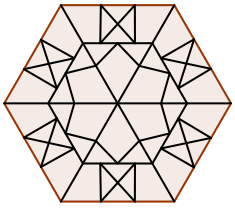
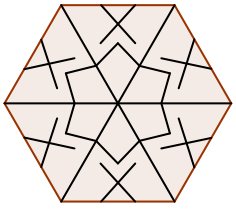
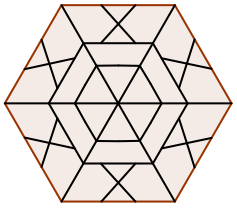
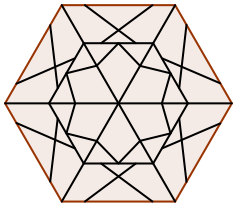
The two tokens with the question mark have the same number. The sum of the four tokens shown is 18. What is the value of one of the missing numbers?



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

SAMPLE QUESTION FOR 5 POINTS

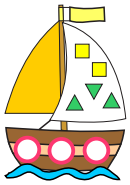
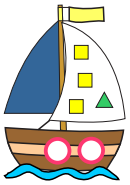
Arjun has 6 identical triangles like this:  . Which of the following pictures can he make?

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

GRADES 1 AND 2 ANSWERS

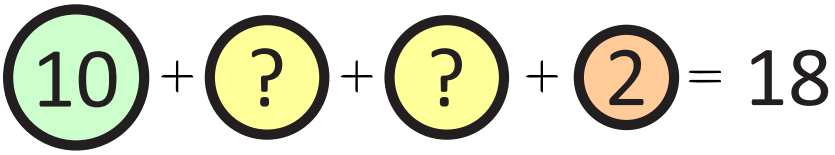
SAMPLE QUESTION FOR 3 POINTS

My boat has more than 1 circle. It also has 2 more triangles than squares. Which boat is mine?

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

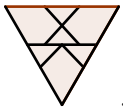
SAMPLE QUESTION FOR 4 POINTS

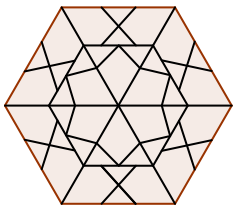
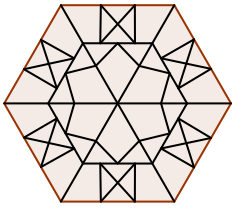
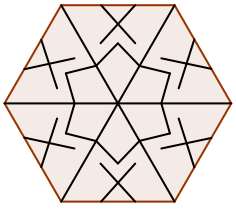
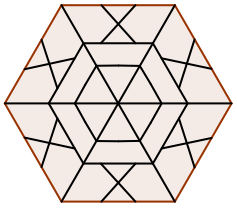
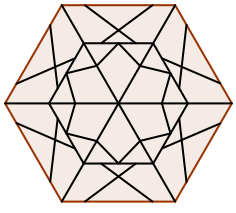
The two tokens with the question mark have the same number. The sum of the four tokens shown is 18. What is the value of one of the missing numbers?



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

SAMPLE QUESTION FOR 5 POINTS

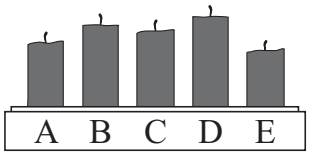
Arjun has 6 identical triangles like this:  . Which of the following pictures can he make?

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

GRADES 3 AND 4

SAMPLE QUESTION FOR 3 POINTS

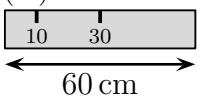
Zoe lit 5 identical candles all at the same time. They stopped burning at different times and now look as shown in the picture. Which candle stopped burning first?

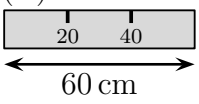


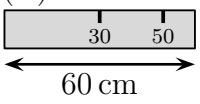
(A) A (B) B (C) C (D) D (E) E

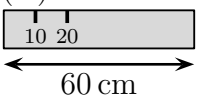
SAMPLE QUESTION FOR 4 POINTS

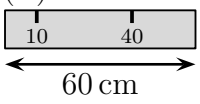
Andrew has a 60 cm ruler. Unfortunately, some of the markings have faded. He can still measure the lengths 10 cm, 20 cm, 30 cm, 40 cm, 50 cm, and 60 cm using his ruler only once. Which is his ruler?

(A)


(B)


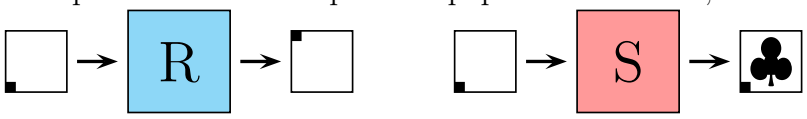
(C)


(D)


(E)


SAMPLE QUESTION FOR 5 POINTS

Chloe has two machines. When she puts a square sheet of paper in machine R, it turns the paper 90° clockwise, as shown in the picture. When she puts the paper in machine S, it stamps the paper with a ♣.



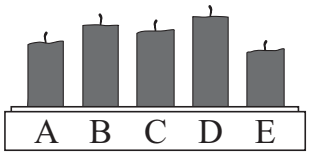
In which order are the machines used to produce the result shown?

(A) SRR (B) RSR (C) RSS (D) RRS (E) SRS

GRADES 3 AND 4 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

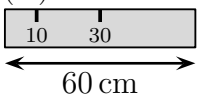
Zoe lit 5 identical candles all at the same time. They stopped burning at different times and now look as shown in the picture. Which candle stopped burning first?

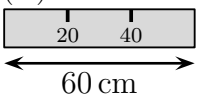


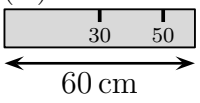
(A) A (B) B (C) C **(D) D** (E) E

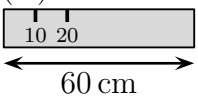
SAMPLE QUESTION FOR 4 POINTS

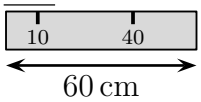
Andrew has a 60 cm ruler. Unfortunately, some of the markings have faded. He can still measure the lengths 10 cm, 20 cm, 30 cm, 40 cm, 50 cm, and 60 cm using his ruler only once. Which is his ruler?

(A)


(B)


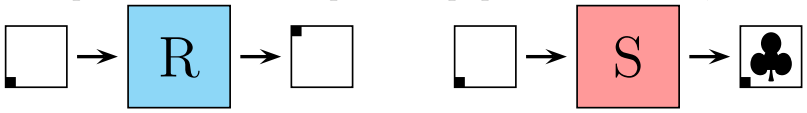
(C)


(D)


(E)


SAMPLE QUESTION FOR 5 POINTS

Chloe has two machines. When she puts a square sheet of paper in machine R, it turns the paper 90° clockwise, as shown in the picture. When she puts the paper in machine S, it stamps the paper with a ♣.



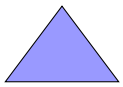
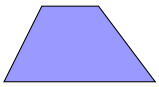
In which order are the machines used to produce the result shown?

(A) SRR **(B) RSR** (C) RSS (D) RRS (E) SRS

GRADES 5 AND 6

SAMPLE QUESTION FOR 3 POINTS

Which of the following shapes cannot be divided into two triangles by a single straight line?

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

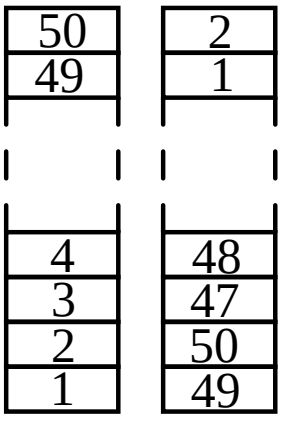
SAMPLE QUESTION FOR 4 POINTS

Maria, Peter, Richard, and Tina were playing football in the classroom and one of them broke a window. When the principal asked who did it, she got the following responses: Maria: "It was Peter." Peter: "It was Richard." Richard: "It wasn't me." Tina: "It wasn't me." Only one child was telling the truth. Who broke the window?

(A) Maria (B) Tina (C) Peter (D) Richard
(E) It can't be determined with certainty.

SAMPLE QUESTION FOR 5 POINTS

On a table there is a tower made of blocks numbered from 1 to 50. Emma builds a new tower in the following way. She takes two blocks from the top of the original tower and puts them on the table as the base of the new tower. She continues by taking the two top blocks from the remainder of the original tower and putting them on the top of the new tower, as seen in the diagram. Which of the following pairs of numbers are on adjacent blocks in the new tower?

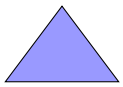
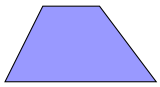


(A) 29 and 28 (B) 34 and 35 (C) 29 and 26
(D) 31 and 33 (E) 27 and 30

GRADES 5 AND 6 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Which of the following shapes cannot be divided into two triangles by a single straight line?

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

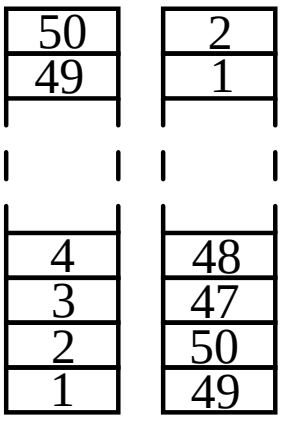
SAMPLE QUESTION FOR 4 POINTS

Maria, Peter, Richard, and Tina were playing football in the classroom and one of them broke a window. When the principal asked who did it, she got the following responses: Maria: "It was Peter." Peter: "It was Richard." Richard: "It wasn't me." Tina: "It wasn't me." Only one child was telling the truth. Who broke the window?

(A) Maria **(B) Tina** (C) Peter (D) Richard
(E) It can't be determined with certainty.

SAMPLE QUESTION FOR 5 POINTS

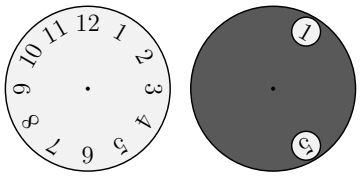
On a table there is a tower made of blocks numbered from 1 to 50. Emma builds a new tower in the following way. She takes two blocks from the top of the original tower and puts them on the table as the base of the new tower. She continues by taking the two top blocks from the remainder of the original tower and putting them on the top of the new tower, as seen in the diagram. Which of the following pairs of numbers are on adjacent blocks in the new tower?



(A) 29 and 28 (B) 34 and 35 (C) 29 and 26
(D) 31 and 33 **(E) 27 and 30**

GRADES 7 AND 8

SAMPLE QUESTION FOR 3 POINTS



A gray circle with two holes in it is placed on top of a clock face, as shown. The gray circle is turned around its center so that an 8 appears in one hole. Which two numbers could be seen in the other hole?

(A) 4 or 12 (B) 1 or 5 (C) 1 or 4 (D) 7 or 11 (E) 5 or 12

SAMPLE QUESTION FOR 4 POINTS

Anika wrote down three consecutive whole numbers in increasing order, but instead of digits she used symbols so wrote □◊◊, ♡△△, ♡△□. What would she write next?

(A) ♡♡◊ (B) □♡□ (C) ♡△◊ (D) ♡◊□ (E) ♡△♡

SAMPLE QUESTION FOR 5 POINTS

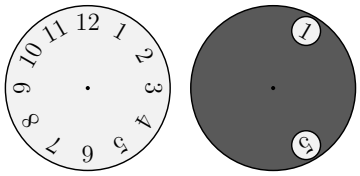
Bart wrote the number 1015 as a sum of numbers using only the digit 7. He used a 7 a total of 10 times, as shown. Now he wants to write the number 2023 as a sum of numbers using only the digit 7, using a 7 a total of 19 times. How many times will he use the number 77?

$$\begin{array}{rr} & 777 \\ & 77 \\ + & 77 \\ & 77 \\ & 7 \\ \hline & 1015 \end{array}$$

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

GRADES 7 AND 8 ANSWERS

SAMPLE QUESTION FOR 3 POINTS



A gray circle with two holes in it is placed on top of a clock face, as shown. The gray circle is turned around its center so that an 8 appears in one hole. Which two numbers could be seen in the other hole?

(A) 4 or 12 (B) 1 or 5 (C) 1 or 4 (D) 7 or 11 (E) 5 or 12

SAMPLE QUESTION FOR 4 POINTS

Anika wrote down three consecutive whole numbers in increasing order, but instead of digits she used symbols so wrote □◊◊, ♡△△, ♡△□. What would she write next?

(A) ♡♡◊ (B) □♡□ (C) ♡△◊ (D) ♡◊□ **(E)** ♡△♡

SAMPLE QUESTION FOR 5 POINTS

Bart wrote the number 1015 as a sum of numbers using only the digit 7. He used a 7 a total of 10 times, as shown. Now he wants to write the number 2023 as a sum of numbers using only the digit 7, using a 7 a total of 19 times. How many times will he use the number 77?

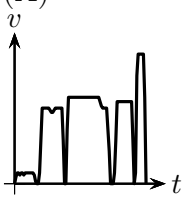
```
  777
   77
+  77
   77
    7
 1015
```

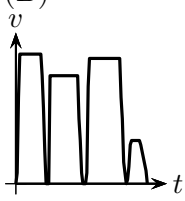
(A) 2 (B) 3 (C) 4 (D) 5 **(E) 6**

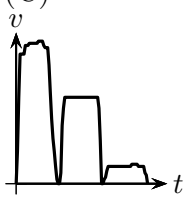
GRADES 9 AND 10

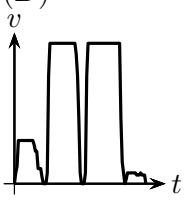
SAMPLE QUESTION FOR 3 POINTS

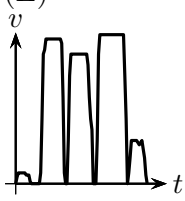
Katie had to run to catch the subway, got off two stops later, and then walked to school. Which of the following speed-time graphs would best represent her journey?

(A) 

(B) 

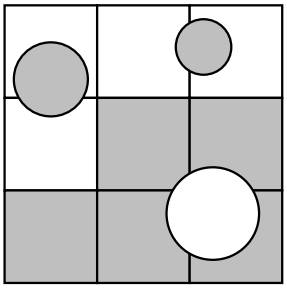
(C) 

(D) 

(E) 

SAMPLE QUESTION FOR 4 POINTS

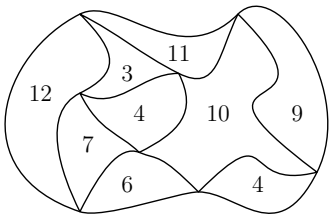
A square of side 30 cm is divided into nine identical smaller squares. The large square contains three circles with radii 5 cm (bottom right), 4 cm (top left), and 3 cm (top right), as shown. What is the area of the shaded part?



(A) 400 cm^2 (B) 500 cm^2 (C) $(400 + 50\pi)$ cm^2
(D) $(500 - 25\pi)$ cm^2 (E) $(500 + 25\pi)$ cm^2

SAMPLE QUESTION FOR 5 POINTS

The diagram shows a map of a park. The park is divided into regions. The number inside each region gives its perimeter, in km. What is the outer perimeter of the park?

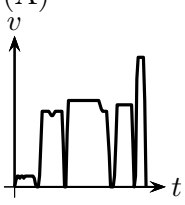


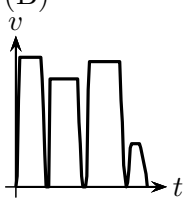
(A) 22 km (B) 26 km (C) 28 km (D) 32 km
(E) None of the above.

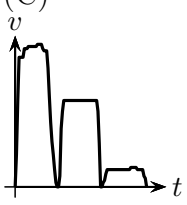
GRADES 9 AND 10 ANSWERS

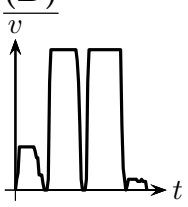
SAMPLE QUESTION FOR 3 POINTS

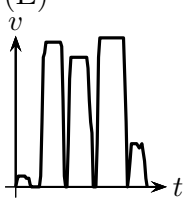
Katie had to run to catch the subway, got off two stops later, and then walked to school. Which of the following speed-time graphs would best represent her journey?

(A) 

(B) 

(C) 

(D) 

(E) 

SAMPLE QUESTION FOR 4 POINTS

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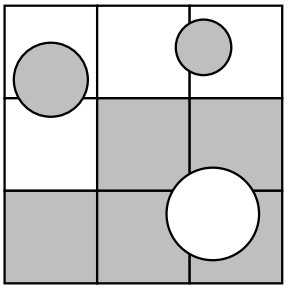
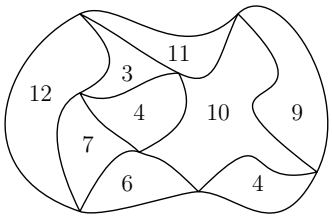


(A) 400 cm^2 **(B) 500 cm^2** (C) $(400 + 50\pi)$ cm^2
(D) $(500 - 25\pi)$ cm^2 (E) $(500 + 25\pi)$ cm^2

SAMPLE QUESTION FOR 5 POINTS

The diagram shows a map of a park. The park is divided into regions. The number inside each region gives its perimeter, in km. What is the outer perimeter of the park?



(A) 22 km **(B) 26 km** (C) 28 km (D) 32 km
(E) None of the above.

GRADES 11 AND 12

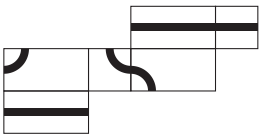
SAMPLE QUESTION FOR 3 POINTS

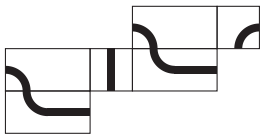
What is the value of $\dfrac{7777^2}{5555 \times 2222}$?

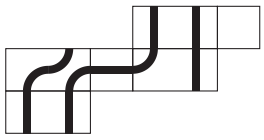
(A) 1 (B) $\frac{7}{10}$ (C) $\frac{49}{10}$ (D) $\frac{77}{110}$ (E) 49

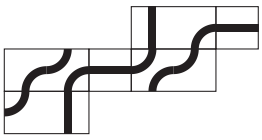
SAMPLE QUESTION FOR 4 POINTS

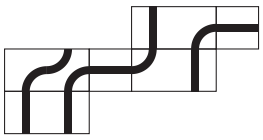
Noah drew a closed path on a rectangular prism. Which net could show his path?

(A) 

(B) 

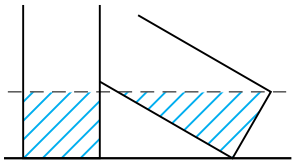
(C) 

(D) 

(E) 

SAMPLE QUESTION FOR 5 POINTS

Two identical cylindrical water tanks contain the same amount of water. One cylinder is standing upright, and the other is leaning against it, and the water level in each of them is the same as in the picture. The bottom of each of the cylinders is a circle with area 3π m^2. How much water does each tank contain?



(A) $3\sqrt{3}\pi$ m^3 (B) 6π m^3 (C) 9π m^3 (D) $\frac{3\pi}{4}$ m^3

(E) It's impossible to determine from the information given.

GRADES 11 AND 12 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

What is the value of $\dfrac{7777^2}{5555 \times 2222}$?

(A) 1 (B) $\frac{7}{10}$ **(C) $\frac{49}{10}$** (D) $\frac{77}{110}$ (E) 49

SAMPLE QUESTION FOR 4 POINTS

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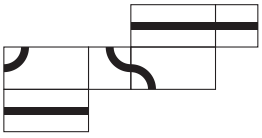
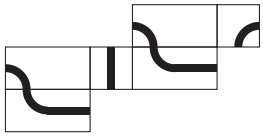
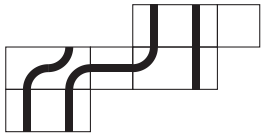
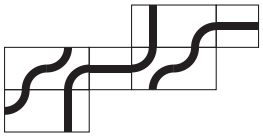
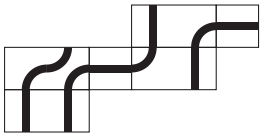
(A) 

(B) 

(C) 

(D) 

(E) 

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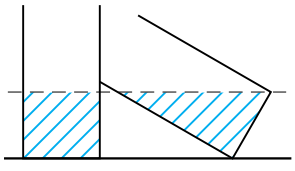

(A) $3\sqrt{3}\pi$ m^3 (B) 6π m^3 **(C) 9π m^3** (D) $\frac{3\pi}{4}$ m^3

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