Math Kangaroo 2013 Sample Questions

LEVELS 1 AND 2

SAMPLE QUESTION FOR 3 POINTS

Which digits are missing on the right?

A) 3 and 5   B) 4 and 8   C) 2 and 0   D) 6 and 9   E) 7 and 1

SAMPLE QUESTION FOR 4 POINTS
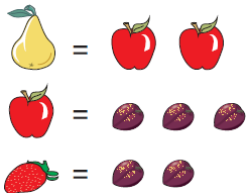
George has 2 cats of the same weight. What is the weight of one cat if George weighs 30 kilograms?

A) 1 kilogram   B) 2 kilograms   C) 3 kilograms
D) 4 kilograms   E) 5 kilograms

SAMPLE QUESTION FOR 5 POINTS

In a certain game it is possible to make the following exchanges:

Adam has 6 pears. How many strawberries will Adam have after he trades all his pears for just strawberries?

A) 12   B) 36   C) 18   D) 24   E) 6

Math Kangaroo 2013 Sample Questions

LEVELS 1 AND 2 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Which digits are missing on the right?

A) 3 and 5   B) 4 and 8   C) 2 and 0   **D) 6 and 9**   E) 7 and 1

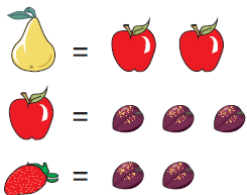**SAMPLE QUESTION FOR 4 POINTS**

George has 2 cats of the same weight. What is the weight of one cat if George weighs 30 kilograms?

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

SAMPLE QUESTION FOR 5 POINTS

In a certain game it is possible to make the following exchanges:

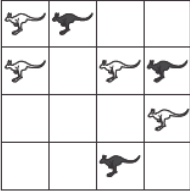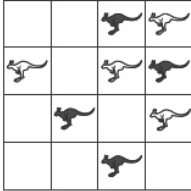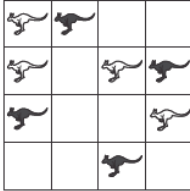Adam has 6 pears. How many strawberries will Adam have after he trades all his pears for just strawberries?
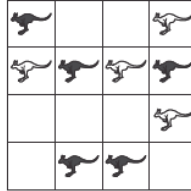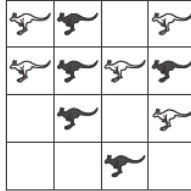
A) 12   B) 36   **C) 18**   D) 24   E) 6

Math Kangaroo 2013 Sample Questions

LEVELS 3 AND 4

SAMPLE QUESTION FOR 3 POINTS

In which figure is the number of black kangaroos larger than the number of white kangaroos?

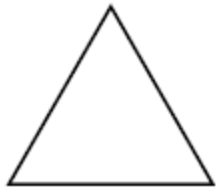A)   B)   C)   D)   E)

SAMPLE QUESTION FOR 4 POINTS

Each time Pinocchio lies, his nose gets 6 cm longer. Each time he tells the truth, his nose gets 2 cm shorter. After his nose was 9 cm long, he told three lies and made two true statements. How long was Pinocchio's nose afterwards?

A) 14 cm   B) 15 cm   C) 19 cm   D) 23 cm   E) 31 cm

SAMPLE QUESTION FOR 5 POINTS

Joining the midpoints of the sides of the triangle in the drawing we obtain a smaller triangle. We repeat this one more time with the smaller triangle. How many triangles of the same size as the smallest resulting triangle fit in the original drawing?
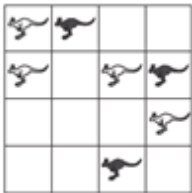

A) 5   B) 8   C) 10   D) 16   E) 32

Math Kangaroo 2013 Sample Questions

LEVELS 3 AND 4 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

In which figure is the number of black kangaroos larger than the number of white kangaroos?

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

SAMPLE QUESTION FOR 4 POINTS

Each time Pinocchio lies, his nose gets 6 cm longer. Each time he tells the truth, his nose gets 2 cm shorter. After his nose was 9 cm long, he told three lies and made two true statements. How long was Pinocchio's nose afterwards?

A) 14 cm   B) 15 cm   C) 19 cm   **D) 23 cm**   E) 31 cm

SAMPLE QUESTION FOR 5 POINTS

Joining the midpoints of the sides of the triangle in the drawing we obtain a smaller triangle. We repeat this one more time with the smaller triangle. How many triangles of the same size as the smallest resulting triangle fit in the original drawing?
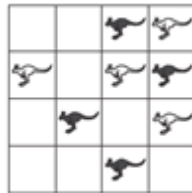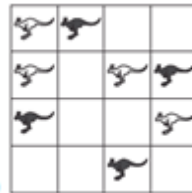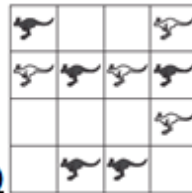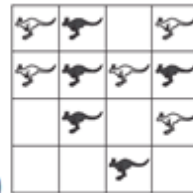

A) 5   B) 8   C) 10   **D) 16**   E) 32

Math Kangaroo 2013 Sample Questions

LEVELS 5 AND 6

SAMPLE QUESTION FOR 3 POINTS

Nathalie wanted to build the same cube as Diana had (Figure 1). However, Nathalie ran out of small cubes and built only a part of the cube, as you can see in Figure 2. How many small cubes must be added to Figure 2 to form Figure 1?

Figure 1   Figure 2

A) 5   B) 6   C) 7   D) 8   E) 9

SAMPLE QUESTION FOR 4 POINTS

Mary shades various shapes on square sheets of paper, as shown.

How many of these shapes have the same perimeter as the sheet of paper itself?

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

SAMPLE QUESTION FOR 5 POINTS

There are four buttons in a row as shown below. Two of them show happy faces, and two of them show sad faces. If we press on a face, its expression turns to the opposite (e.g. a happy face turns into a sad face). In addition to this, the adjacent buttons also change their expressions to the opposite. What is the least number of times you need to press the buttons in order to get all happy faces?

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

Math Kangaroo 2013 Sample Questions

LEVELS 5 AND 6 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Nathalie wanted to build the same cube as Diana had (Figure 1). However, Nathalie ran out of small cubes and built only a part of the cube, as you can see in Figure 2. How many small cubes must be added to Figure 2 to form Figure 1?
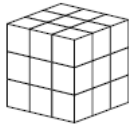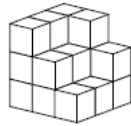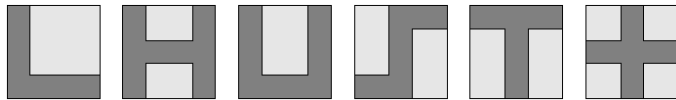

Figure 1   Figure 2

A) 5   B) 6   **C) 7**   D) 8   E) 9

SAMPLE QUESTION FOR 4 POINTS

Mary shades various shapes on square sheets of paper, as shown.
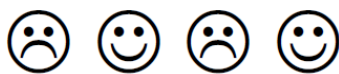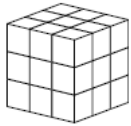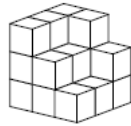

How many of these shapes have the same perimeter as the sheet of paper itself?

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

SAMPLE QUESTION FOR 5 POINTS

There are four buttons in a row as shown below. Two of them show happy faces, and two of them show sad faces. If we press on a face, its expression turns to the opposite (e.g. a happy face turns into a sad face). In addition to this, the adjacent buttons also change their expressions to the opposite. What is the least number of times you need to press the buttons in order to get all happy faces?

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

Math Kangaroo 2013 Sample Questions

LEVELS 7 AND 8

SAMPLE QUESTION FOR 3 POINTS

In the picture, the big triangle is equilateral and has an area of 9. The lines are parallel to the sides and divide the sides into three equal parts. What is the area of the shaded part?

A) 1   B) 4   C) 5   D) 6   E) 7

SAMPLE QUESTION FOR 4 POINTS

Vasya wrote down several consecutive integers. Which of the following could not be the percentage of odd numbers among them?

A) 40   B) 45   C) 48   D) 50   E) 60

SAMPLE QUESTION FOR 5 POINTS

The diagram shows a shaded quadrilateral *KLMN* drawn on a grid. Each cell of the grid has sides of length 2 cm. What is the area of *KLMN*?

A) 96 cm^2 B) 84 cm^2 C) 76 cm^2 D) 88 cm^2 E) 104 cm^2

Math Kangaroo 2013 Sample Questions

LEVELS 7 AND 8 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

In the picture, the big triangle is equilateral and has an area of 9. The lines are parallel to the sides and divide the sides into three equal parts. What is the area of the shaded part?

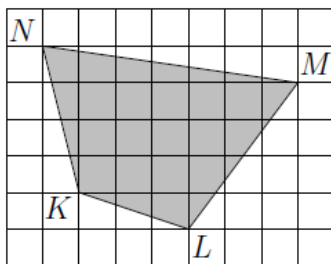A) 1   B) 4   C) 5   **D) 6**   E) 7

SAMPLE QUESTION FOR 4 POINTS

Vasya wrote down several consecutive integers. Which of the following could not be the percentage of odd numbers among them?

A) 40   **B) 45**   C) 48   D) 50   E) 60

SAMPLE QUESTION FOR 5 POINTS

The diagram shows a shaded quadrilateral *KLMN* drawn on a grid. Each cell of the grid has sides of length 2 cm. What is the area of *KLMN*?
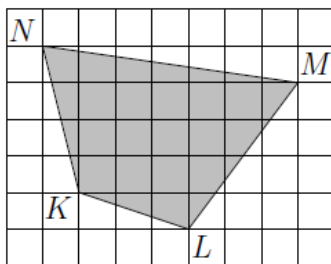
A) 96 cm^2 **B) 84 cm^2**   C) 76 cm^2 D) 88 cm^2 E) 104 cm^2

Math Kangaroo 2013 Sample Questions

LEVELS 9 AND 10

SAMPLE QUESTION FOR 3 POINTS

The number 200013 – 2013 is not divisible by

A) 2.   B) 3.   C) 5.   D) 7.   E) 11.

SAMPLE QUESTION FOR 4 POINTS

The points P and Q are opposite vertices of a regular hexagon and the points R and S are the midpoints of opposite edges, as shown. The area of the hexagon is 60 cm^2. What is the product of the lengths of PQ and RS?

A) 40 cm^2 B) 50 cm^2 C) 60 cm^2 D) 80 cm^2 E) 100 cm^2

SAMPLE QUESTION FOR 5 POINTS

How many positive integers are multiples of 2013 and have exactly 2013 divisors (including 1 and the number itself)?

A) 0   B) 1   C) 3   D) 6   E) other answer

Math Kangaroo 2013 Sample Questions
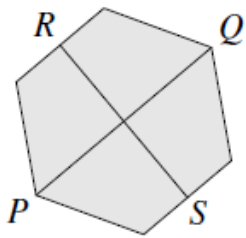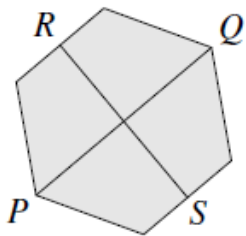
LEVELS 9 AND 10 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

The number 200013 – 2013 is not divisible by

A) 2.   B) 3.   C) 5.   **D) 7.**   E) 11.

SAMPLE QUESTION FOR 4 POINTS

The points P and Q are opposite vertices of a regular hexagon and the points R and S are the midpoints of opposite edges, as shown. The area of the hexagon is 60 cm^2. What is the product of the lengths of PQ and RS?

A) 40 cm^2 B) 50 cm^2 C) 60 cm^2 **D) 80 cm^2**   E) 100 cm^2

SAMPLE QUESTION FOR 5 POINTS

How many positive integers are multiples of 2013 and have exactly 2013 divisors (including 1 and the number itself)?

A) 0   B) 1   C) 3   **D) 6**   E) other answer

Math Kangaroo 2013 Sample Questions

LEVELS 11 AND 12

SAMPLE QUESTION FOR 3 POINTS

Which of the following numbers is the largest?

A) 2013   B) 2^{0+13} C) 20^{13} D) 201^{3} E) $20 \cdot 13$

SAMPLE QUESTION FOR 4 POINTS

Radu has identical plastic pieces in the shape of a regular pentagon. He glues them edge to edge to complete a circle, as shown in the picture. How many pieces are there in this circle?

A) 8   B) 9   C) 10   D) 12   E) 15

SAMPLE QUESTION FOR 5 POINTS

How many pairs (x, y) of integers with $x \le y$ exist such that their product equals 5 times their sum?

A) 4   B) 5   C) 6   D) 7   E) 8

Math Kangaroo 2013 Sample Questions

LEVELS 11 AND 12 ANSWERS

SAMPLE QUESTION FOR 3 POINTS

Which of the following numbers is the largest?

A) 2013   B) 2^{0+13} **C) 20^{13}**   D) 201^3 E) $20 \cdot 13$

SAMPLE QUESTION FOR 4 POINTS

Radu has identical plastic pieces in the shape of a regular pentagon. He glues them edge to edge to complete a circle, as shown in the picture. How many pieces are there in this circle?

A) 8   B) 9   **C) 10**   D) 12   E) 15

SAMPLE QUESTION FOR 5 POINTS

How many pairs (x, y) of integers with $x \leq y$ exist such that their product equals 5 times their sum?

A) 4   B) 5   C) 6   D) 7   E) 8