

Level 1

1. John was trying to place parentheses in the expression $6 \times 8 + 20 \div 4 - 2$ in such a way as to get 58 as the result. Which of the ways shown below would give this result?

A. $6 \times (8 + 20) \div 4 - 2$ B. $(6 \times 8 + 20 \div 4) - 2$ C. $(6 \times 8 + 20) \div 4 - 2$
D. $6 \times 8 + 20 \div (4 - 2)$ **E. $6 \times (8 + 20 \div 4) - 2$**

2. How many three-digit numbers can you create using the digits 3, 0, and 7, and using each digit only once?

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

3. Joanna baked some cookies. She tried to divide them equally between two plates, then between three plates, and finally between four plates. Each time she had one cookie left over. How many cookies did Joanna bake?

A. 9 B. 10 C. 11 **D. 12** E. 13

4. There were 31 runners competing in a race. The number of runners who finished before John is four times smaller than the number of runners who finished later than John. At what place did John finish?

A. 6 B. 7 C. 8 D. 20 **E. 21**

5. There are 15 balls in a box: white balls, red balls, and black balls. The number of white balls is seven times greater than the number of red balls. How many black balls are there in the box?

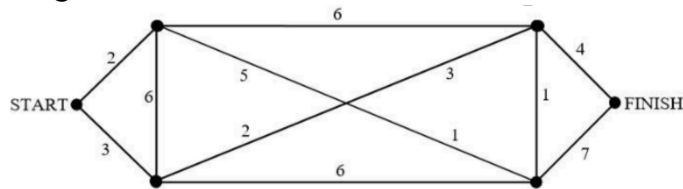
A. 1 B. 3 C. 5 **D. 7** E. 9

6. Ania is three years older than Basia and two years younger than Celina. Dorota is one year younger than Basia. How much older is Celina than Dorota?

- A. 5 years B. 6 years C. 4 years D. 2 years E. They are the same age.

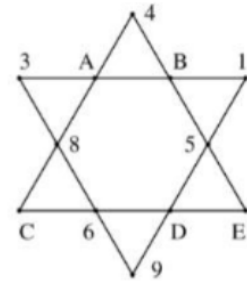
Level 2

1. A kangaroo was traveling from START to FINISH using the paths shown in the picture. Each segment is marked with the time (in minutes) which the kangaroo needs to travel that segment. What is the shortest time needed for the kangaroo to reach FINISH?



- A. 11 minutes B. 13 minutes C. 16 minutes D. 19 minutes
 E. 12 minutes
2. In how many ways can you place two identical one-dollar coins in three pockets?
- A. 2 B. 3 C. 4 D. 6 E. 8
3. A watermelon weighs $\frac{4}{5}$ kg more than $\frac{4}{5}$ of the same watermelon. How much does the watermelon weigh?
- A. $\frac{8}{5}$ kg B. 4 kg C. 3 kg D. 4.5 kg E. 5 kg
4. John and Stan each have three cards marked with digits. John's cards are marked with the digits 2, 4, and 6, and Stan's cards are marked with the digits 1, 3, and 5. They are taking turns placing their cards in this diagram: . John will fill the first spot on the left, Stan the second spot, etc. John is trying to make the final number as small as possible, and Stan is trying to make it as large as possible. What number will they form?
- A. 123456 B. 654321 C. 254361 D. 253146 E. 253416

5. Whole numbers from 1 to 12 are placed in the figure in such a way that the sum of the four numbers found along each segment is the same (see the figure). Under which letter is the number 7 hidden?



- A. A B. B C. C D. D E. E
6. In the basketball semi-finals, team A plays against team B and team C plays against team D. The winners of these two games will play against each other for the first and second place, and the losers will play for the third and fourth place. How many possible outcomes are there?

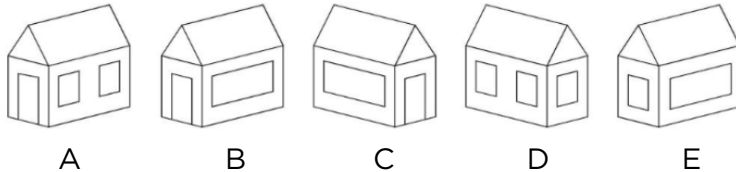
- A. 4 B. 8 C. 12 D. 16 E. 24

Level 3

1. Among the puzzle pieces below, two have the same area? Which two?



- A. 2 and 4 B. 1 and 5 C. 1 and 3 D. 4 and 5 E. 3 and 5
2. In the diagrams below, house X is shown four times (from different sides), and house Y is shown just once. Which picture shows house Y?



3. In triangle ABC , the bisectors of angles $\angle ABC$ and $\angle ACB$ intersect at point D . We know that $\angle BDC = 150^\circ$. What is the measure of $\angle BAC$?

- A. 100° B. This cannot be determined. C. 110° D. 120°
 E. 130°
4. In a room there are stools and chairs. On each stool and on each chair there is a child. The stools have three legs each, the chairs have four legs each, and each child has two legs. Altogether there are 39 legs. How many chairs are there in the room?
- A. 3 B. 4 C. 5 D. 6 E. 9
5. This morning, my odometer read 021,120, which means I had driven a total of 21,120 miles in my car. 021,120 is a palindrome, which means it reads the same from right to left as from left to right. How many palindromes occur on the odometer starting with 000,000 and ending with 999,999?
- A. 1,000 B. 999 C. 100 D. 999,999 E. 666,666

6. The numbers 1, 2, 3, ..., 1022, 1023, and 1024 have been placed around a circle clockwise in the order given. We move around the circle clockwise and erase every other number until only one number is left. Which number will be the last one left if we erase number 1 first?

A. 2

B. 32

C. 128

D. 512

E. 1024

Level 4

1. What angle do the hour hand and the minute hand of a clock form at 9:20?
A. 140° B. 150° C. 160° D. 165° E. 170°
2. What is the ones digit of the number
 $1 + 1 \times 2 + 1 \times 2 \times 3 + \dots + 1 \times 2 \times 3 \times \dots \times 999$?
A. 1 B. 3 C. 5 D. 7 E. 9
3. Seven mushroom pickers found a total of 707 mushrooms. It turned out that each one of them found a different number of mushrooms. The person who found the most mushrooms had six mushrooms more than the person who found the least. How many mushrooms did the person who found the most have?
A. 107 B. 105 C. 104 D. 101 E. 98
4. If $a * b = \max\{2a, a + b\}$, then $(2 * 3) * (3 * 2)$ equals
A. 9 B. 10 C. 11 D. 12 E. 13
5. On a globe the shape of a sphere with a radius of R , a circle was drawn by a compass whose legs were set a distance of R apart (the spike was placed at one of the poles on the globe). What is the length of the parallel (the circle on the globe marking latitude, as it were) that was drawn?
A. πR B. $\frac{3\pi R}{2}$ C. $\pi R\sqrt{3}$ D. $2\pi R$ E. $2\pi R\sqrt{3}$

6. The numbers 1, 2, 3, ..., 1996, 1997, and 1999 have been placed around a circle in the order given. We move around the circle clockwise and erase every other number until only one number is left. Which number will be the last one left if we erase number 1 first?

A. 2

B. 512

C. 1024

D. 1948

E. 1998

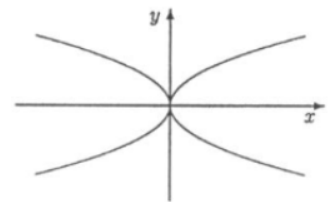
Level 5

1. A regular star with six points was formed by overlapping two equilateral triangles (see the picture). The area of each triangle is 36 cm^2 . What is the area of the shaded hexagon in cm^2 ?



A. 18 B. 24 C. 30 D. 36 E. 48

2. Given are the functions: $y = x^2$, $y = -x^2$, $y = \sqrt{x}$, $y = -\sqrt{x}$, $y = \sqrt{-x}$, $y = -\sqrt{-x}$, $y = \sqrt{|x|}$, and $y = -\sqrt{|x|}$. How many of these functions are shown in the graph to the right?



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

3. There are 20 jars of jam in a dark cellar. Among them, there are eight jars with strawberry jam, seven with raspberry jam, and five with cranberry jam. What is the greatest number of jars that can be taken out at random in the dark so that we can be sure that at least four jars of one kind of jam and three jars of another would be left in the cellar?

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

4. Five teams, A, B, C, D, and E, participated in a volleyball tournament. Each team played against each of the other teams once. The team which won a game received two points, and in the case of a tie each team received one point. At the end of the tournament, each team had a different number of points. Team B got second place and had as many points as teams C, D, and E together. Which of the statements regarding the game between teams B and C is true?

A. Team B won.
 B. Team C won.
 C. Team B did not beat team C.
 D. The game ended in a tie.
 E. The result of the game cannot be determined.

5. If the length of one of the medians of a triangle is equal to the radius of a circle circumscribed about this triangle, then this triangle is

- A. acute B. obtuse C. right D. acute or right E. obtuse or right

6. A cone with a height of 3 was cut with two planes parallel to the base of the cone into three parts of equal volume. At what heights was the cone cut?

- A. 1 and 2 B. $3 - \sqrt[3]{18}$ and $3 - \sqrt[3]{9}$ C. $\sqrt[3]{3}$ and $\sqrt[3]{6}$ D. $\frac{\sqrt[3]{3}}{3}$ and $\frac{2\sqrt[3]{3}}{3}$
E. It is impossible to divide the cone in this way.