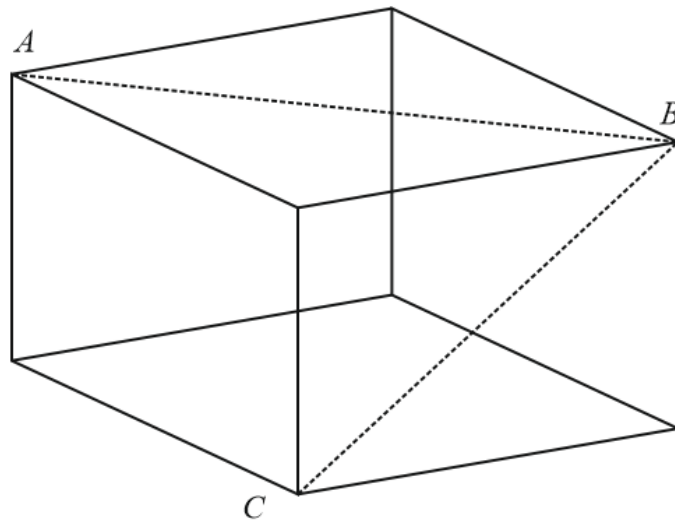


Round 1

- 1 A diagonal of a rectangle is $\sqrt{13}$ m and the area of the rectangle is 6 m^2 . What is the perimeter of the rectangle?
- a 12 m b 10 m c 8 d 6
- 2 If 5 is added to the numerator of a certain fraction and 2 is added to the denominator, the value of the fraction is tripled. What is the value of the original fraction?
- a $\frac{5}{7}$ b $\frac{3}{4}$ c $\frac{2}{3}$ d $\frac{1}{2}$
- 3 Find a number ending in 8 that is the product of two or more consecutive whole numbers.
- a 9128 b 128 c 48 d No such number exists
- 4 The diagram shows a cube with side of 1 unit. What is the measure of angle ABC .



- a 100° b 90° c 60° d 45°
- 5 Arrange the digits 5, 6, 7, 8, and 9 in the boxes to maximize the product.
- $\square\square\square \times \square\square$
- a 875×96 b 987×65 c 976×85 d 965×87

- 6 List the numbers 2^{100} , 3^{75} , and 5^{50} in order from the largest to the smallest.
- a $2^{100} > 3^{75} > 5^{50}$ b $3^{75} > 5^{50} > 2^{100}$
 c $5^{50} > 3^{75} > 2^{100}$ d $5^{50} > 2^{100} > 3^{75}$
- 7 Five Cs and five Bs are arranged in a row as shown: CCCCCBBBBB. Switching just 2 adjacent letters at a time, what is the least number of moves that will result in the arrangement CBCBCBCBCB?
- a 5 b 8 c 9 d 10
- 8 M and P both play on the school basketball team. M made 38 out of 50 shots during the first half of the season, and P made 30 out of 40 attempts. During the second half of the season, M made 42 of 70 attempts and P made 14 out of 24. Who had the best shooting percent during the first half? The second half? The entire season?
- a M, M, M b M, M, P c P, P, P d P, P, M
- 9 A 60-page newspaper has the sheet with page 7 missing. What other pages are also missing?
- a 8, 53, 54 b 6, 52, 53 c 8, 47, 48 d 8, 46, 47
- 10 An apple, an orange, a banana, and a pear are laid out in a straight line. The orange is not on either end and is somewhere to the right of the banana. In how many ways can the fruit be laid out?



(This figure is only a demonstration and does not represent the situation!)

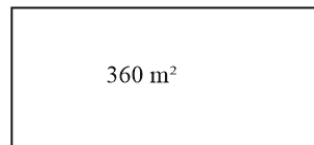
- a 12 b 10 c 6 d 2

- 11 Given that Δ and $@$ represent different operations $(+, -, \times, \div)$ and x represents a digit, find x .

$$62 \Delta x = 29 @ x$$

- a 1 b 31 c 2 d not possible

- 12 The area of a rectangle is 360 m^2 . If its length is increased by 10 m and its width is decreased by 6 m, then its area does not change. What is the perimeter of the original rectangle?



- a 126 m b 106 m c 76 m d 38 m

- 13 The sum of the square roots of two numbers is 5. The two numbers also differ by 5. What are the numbers?

- a 16 and 1 b 1 and 6 c 20 and 25 d 4 and 9

- 14 You have a list of ten numbered statements:

1. Statement 2 is false.

2. Statement 3 is false.

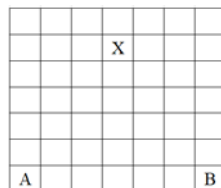


10. Statement 1 is false.

How many statements are true?

- a 5 b 2 c 1 d 0

- 15 The following array is 7×7 . We want to start at A, pass exactly once through *every* square except X, and end at B. You can move only left or right, up or down, and one square at a time. In how many ways can you succeed?



- a 3 b 2 c 1 d 0

- 16 A child cuts a 3 by 3 square from a calendar page (Sample is shown). If the sum of the 9 dates is divisible by 13, what is the date in the lower -left corner of the square?

14	15	16
21	22	23
28	29	30

- a 11 b 13 c 19 d 21
- 17 A triangle has sides of length 50 m, 40, m, and 30 m. What is the length of the shortest altitude of this triangle?
- a 30 m b 24 m c 25 m d $\sqrt{48} m$
- 18 Which of the following numbers is a perfect square?
724203, 326047, 964328, 389372, 329476
- a 329476 b 964328
c 326047 d None of the numbers
- 19 The scale on a map states that 1 cm represents 6 km. how many square kilometers would be represented by an area 240 cm²?
- a 1440 km² b 8640 km² c 14400 km d 86.40 km²
- 20 Let $a_n = \frac{1}{n} - \frac{1}{n+1}$. Find the value of $a_1 + a_2 + a_3 + \cdots + a_{100}$
- a 2 b $\frac{3}{2}$ c 1 d $\frac{100}{101}$