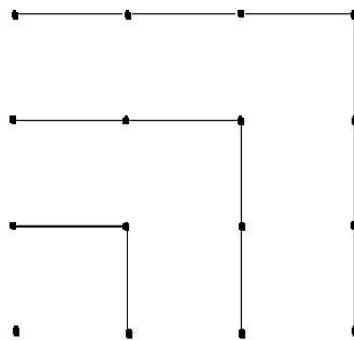


SAMPLE QUESTIONS - MATHEMATICS, CATEGORY 3

- What is the difference between the sum of the first 100 positive even numbers and the sum of the first 100 positive odd numbers?
 A) 4 B) 50 C) 100 D) 500 E) 2020

- Using next picture, we can observe that $1 + 3 + 5 + 7 = 4 \times 4$. What is the value of $1 + 3 + 5 + 7 + \dots + 17 + 19 + 21 = ?$

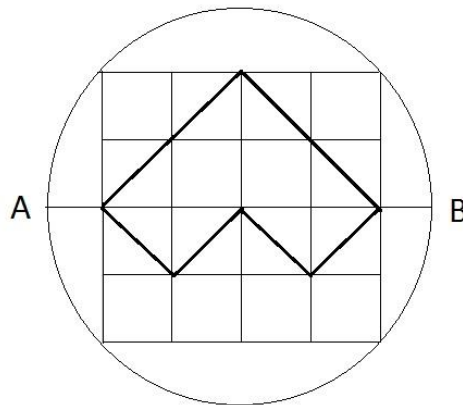


- A) 10×10 B) 11×11 C) 12×12 D) 13×13 E) 21×21
- Clock shows $22 : 22$. How many minutes are there until midnight?
 A) 178 B) 138 C) 128 D) 108 E) 98

 - Which of the followings has the same remainder when it is divided by 2 as when it is divided by 3?

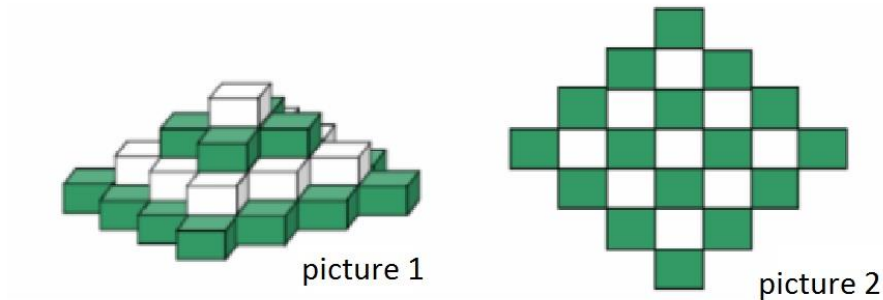
- A) 3 B) 5 C) 7 D) 9 E) 11

5. The diameter AB of the circle is 15 cm (as shown in the figure). What is the perimeter of the figure, which is marked with line, if the rectangles in the figure are coincident?



- A) 16 B) 20 C) 25 D) 30 E) 32

6. In a toys shop, a four-floor green and white “brick flower” is displayed (picture 1). Each floor is made of bricks of the same color. On picture 2, the flower is shown from the top. How many white bricks were used to make the flower?



- A) 9 B) 10 C) 12 D) 14 E) 15

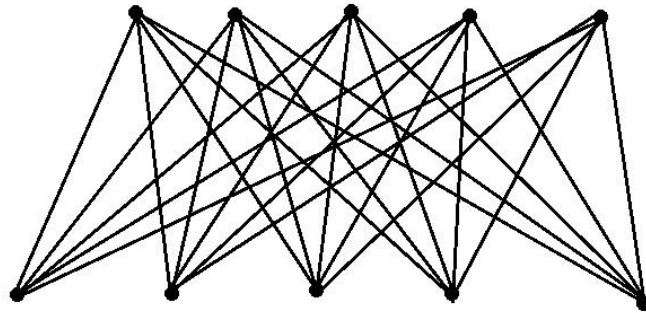
7. Solve $\left(1 - \frac{1}{2^2}\right) \cdot \left(1 - \frac{1}{3^2}\right) \cdot \left(1 - \frac{1}{4^2}\right) \cdot \dots \cdot \left(1 - \frac{1}{10^2}\right) = ?$

- A) $\frac{9}{20}$ B) $\frac{11}{10}$ C) $\frac{11}{20}$ D) $\frac{9}{10}$ E) $\frac{10}{11}$

8. Fine the simplest form of $\frac{\sqrt[3]{a^2 + a}}{\sqrt[3]{a} + a} - \frac{\sqrt[3]{a} - 1}{\sqrt[3]{a^2} + 1} = ?$

- A) a B) \sqrt{a} C) $\sqrt[3]{a}$ D) **1** E) -1

9. Alex has connected all the upper points to all the lower points. How many lines Alex has drawn?



- A) 20 B) 25 C) 30 D) 35 E) 40

10. According to the equation, what is the value of multiplication of x?

$$\sqrt{x+1} = \sqrt[3]{x+1}$$

- A) -1 B) 0 C) 1 D) 2 E) 3

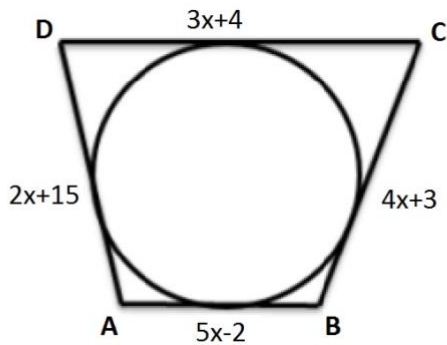
11. Find perimeter of ABCD

If $|AB| = 5x - 2;$

$$|BC| = 4x + 3;$$

$$|CD| = 3x + 4;$$

$$|AD| = 2x + 15$$



- A) 62 B) 92 C) 112 D) 122 E) 132

12. Look at the numbers 1, 2, 3, 4, ..., 100. What percent of these numbers has not perfect square?

- A) 1% B) 10% C) 25% D) 50% E) 90%

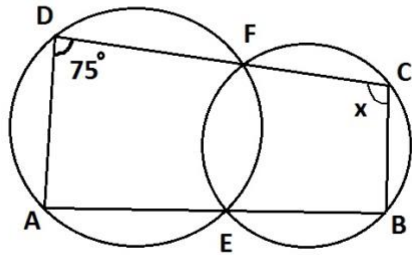
13. If the sum of five consecutive positive integers is 2020, then the largest of these numbers is

- A) 402 B) 404 C) 406 D) 1010 E) 2020

14. If $f(x) = x^2$, $g(x) = 3x + 5$, find $(g \circ f \circ g^{-1})(x) = ?$

- A) $3x^2 + 5$ B) $\frac{x^2 - 10x + 40}{3}$ C) $9x^2 + 30x + 25$ D) $x^2 - 10x + 25$ E) $\frac{x^2 - 10x + 25}{3}$

15. If $m(\angle ADC) = 75^\circ$, then find $m(\angle BCD) = x^\circ$



- A) 75 B) 90 C) 105 D) 115 E) 120

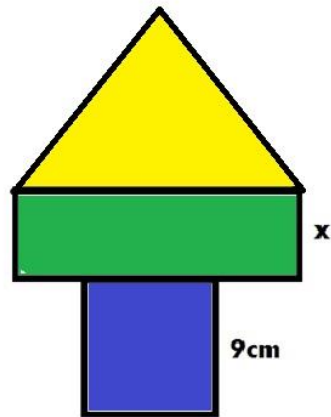
16. Find the remainder when $(2004 \cdot 10875) + 4640985 - 285$ is divided by 4

- A) -1 B) 0 C) 1 D) 2 E) 3

17. If $P\left(\frac{3x+7}{5}\right) = x^3 - 4x^2 + 2ax - 5$ and $P(2) = 0$, find $a = ?$

- A) -3 B) -2 C) 1 D) 2 E) 4

18. "Tower" at the picture is formed of three structures – square, rectangle and equilateral triangle. Perimeter of all three structures is the same. Side of the square is 9 cm long. Find the length of x .



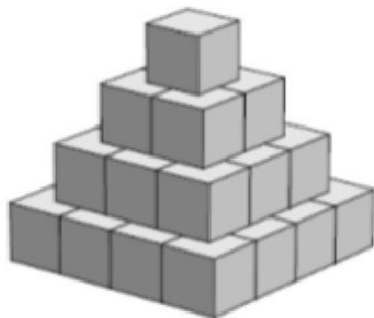
- A) 4 cm B) 5 cm C) 6 cm D) 7 cm E) 8 cm

19. What is the smallest prime number that is the sum of tree different prime numbers?

- A) 11 B) 15 C) 17 D) 19 E) 23

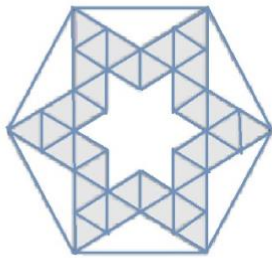
20. The diagram shows a pyramid made up of 30 cubes, each measuring $1m \times 1m \times 1m$.

What is the total surface area of the whole pyramid including its base?



- A) $30 m^2$ B) $62 m^2$ C) $72 m^2$ D) $152 m^2$ E) $180 m^2$

21. The diagram shows a shaded region inside a regular hexagon. The shaded region is divided into equilateral triangles. What fraction of the area of the hexagon is shaded?



- A) $\frac{3}{8}$ B) $\frac{2}{5}$ C) $\frac{3}{7}$ D) $\frac{5}{12}$ E) $\frac{1}{2}$

22. A palindromic number is a number, which reads the same when the order of its digits is reserved. What is the difference between the largest and smallest five-digit palindromic numbers that are both multiples of 45?

- A) 9180 B) 9090 C) 9000 D) 8910 E) 8190

23. Different figures represent different digits. Find the digit corresponding to the square of square.

$$\begin{array}{r}
 \square \\
 \square \\
 + \quad \bigcirc \quad \bigcirc \\
 \hline
 \triangle \quad \triangle \quad \triangle
 \end{array}$$

- A) 1 B) 6 C) 9 D) 36 E) 81

24. Simplify the expression $\frac{\left(\frac{1}{6} + 0,1 + \frac{1}{15}\right) : \left(\frac{1}{6} + 0,1 - \frac{1}{15}\right) \cdot 2,52}{\left(0,5 - \frac{1}{3} + 0,25 - \frac{1}{5}\right) : \left(0,25 - \frac{1}{6}\right) \cdot \frac{7}{13}}$

- (A) 0 (B) 1 (C) 2 (D) 3 (E) 4

25. In the xy -plane, the segment with endpoints $(-1,0)$ and $(25,0)$ is the diameter of a circle. If the point $(x, 13)$ is on the circle, then find x .
- (A) 10.5 (B) 12 (C) 15.5 (D) 17 (E) 20