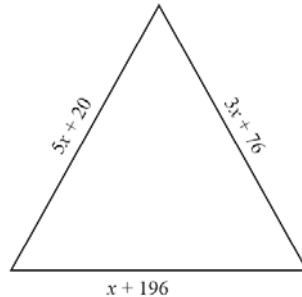
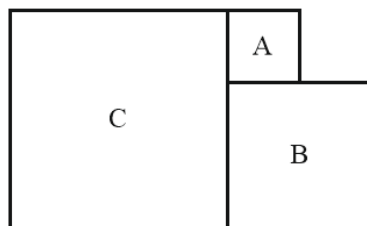


Round 2

- 1 What is the greatest possible perimeter of this triangle given that the triangle is isosceles? Measures are in meters.

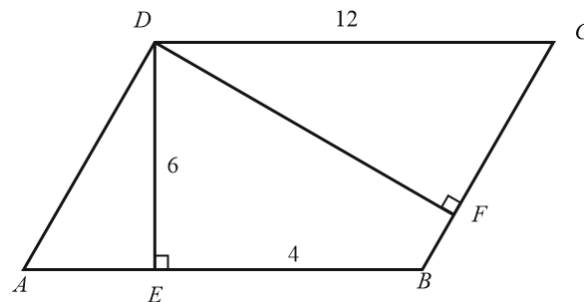


- a 832 m b 544 m c 688 m d 772 m
- 2 A perfect number equals the sum of its factors excluding itself. For example, $6 = 1 + 2 + 3$ is perfect. Which of the following is not a perfect number?
- a 28 b 496 c 18 d 8128
- 3 Find the radius of the circle inscribed in a triangle with sides 100 m, 80 m, and 60 m.
- a 50 m b 40 m c 30 m d 20 m
- 4 Figures A, B, and C are squares. The perimeter of A is 12 cm and the perimeter of B is 24 cm. Find the perimeter of C.



- a 18 b 36 c 72 d 81
- 5 A *lucky* year is one in which at least one date written in the form day/month/year, has the following property: the product of the day times the month equals the last two digits of the year. For example, 1991 is a lucky year because it has the date 13/7/1991 and $13 \times 7 = 91$. Which of the following is *not* a lucky year?
- a 1956 b 1994 c 1993 d 2024

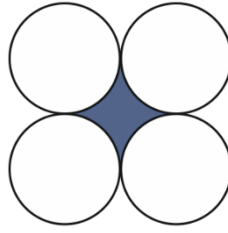
- 6 What is the sum of the largest and smallest prime factors of 5445?
- a 8 b 14 c 16 d 22
- 7 How many distinct triangles can be constructed by connecting three vertices of a cube?
- a 8 b 24 c 48 d 56
- 8 In a parallelogram $ABCD$, $\overline{DE}$ is perpendicular to $\overline{AB}$ and $\overline{DF}$ is perpendicular to $\overline{BC}$. If $DC = 12$, $EB = 4$, and $DE = 6$, Find the length of DF . All measures are in centimeters and figure is not to scale.



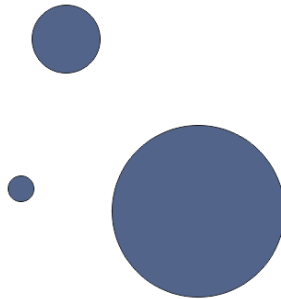
- a 6.4 cm b 7 cm c 7.2 cm d 10 cm
- 9 In triangle ABC , BD bisects angle ABC . Also, $AD = BD = BC$. Find the measure of angle A .
-
- a 36° b 30° c 45° d 60°
- 10 How many integers in the set
 $\{100, 101, 102, 103, \dots, 998, 999\}$
 Do not contain the digits 3, 5, 6, or 7?

- a 120 b 160 c 180 d 294

- 11 Each circle has a radius of 3 cm and are tangent to each other as shown. Determine the area of the shaded region.

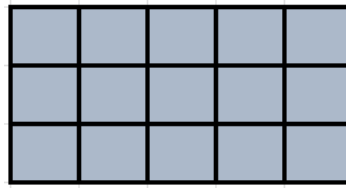


- a $36 - 9\pi \text{ cm}^2$ b 7 cm^2
 c $24 - 9\pi \text{ cm}^2$ d $9\pi - 24 \text{ cm}^2$
- 12 A graphic artist is creating a logo to represent a company's image. She wants to construct a circle that is tangent to all three circles. How many different logos are possible? (The three original circles cannot be arranged differently.)



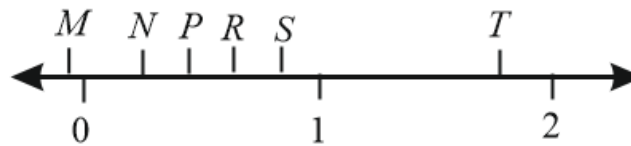
- a 2 b 4 c 6 d 8
- 13 All *corners* were sliced off a cube whose volume was 2000 cm^3 leaving new triangular faces at these corners. Each triangle is equilateral with 5-cm sides. What is the total number of edges on the new solid?
- a 18 b 24 c 36 d 40
- 14 Two numbers have a sum of 50 and a product of 25. Find the sum of their reciprocals.
- a 1 b 2 c 5 d 10
- 15 You have 3 boxes: A red box, a blue box, and a green box. Inside each box is a single ball of the same color as the box. Someone takes each ball out and puts it in a different box. You open the red box and discover a green ball. What color ball is in the blue box?
- a red b blue or red c blue d green

- 16 How many rectangles are in the figure?



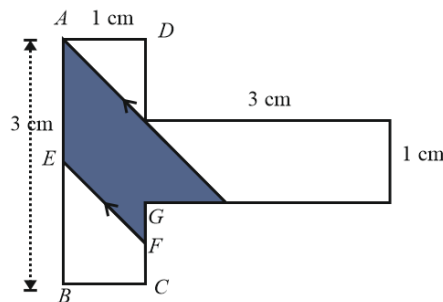
- a 90 b 75 c 16 d 15

- 17 If the fractions represented by the points R and P are multiplied, what point on the number line best represents their product?



- a M b S c N d T

- 18 Given this puzzle made up of four pieces as shown. E and F are the midpoints of AB and CG , respectively. Find the area of the shaded region.



- a 3 cm^2 b 2.5 cm^2 c 2.25 cm^2 d 2 cm^2

- 19 A number is randomly selected from 1 through 100. Given that the number selected is prime, what is the probability that it contains the digit 7?

- a $\frac{7}{24}$ b $\frac{9}{25}$ c $\frac{6}{25}$ d $\frac{1}{3}$

- 20 The total number of interior angles in two regular polygons is 17, and the total number of diagonals is 53. How many sides does each of these polygons have?

- a 6 and 11 b 5 and 12 c 4 and 13 d 7 and 10