



CREST Mathematics Olympiad (CMO) Worksheet *for* Class 7



Topic
Mensuration



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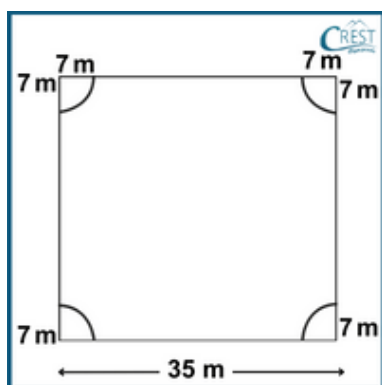
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Worksheet on Mensuration

1. If the length and the breadth of a rectangular paper are 37 cm and 21 cm, what is the area of the largest circle which can be cut out of this paper?

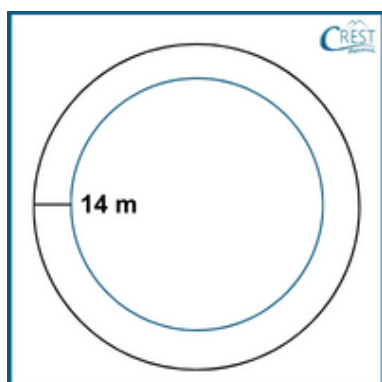
a. 346.5 cm^2
b. 537.82 cm^2
c. 693 cm^2
d. 1075.64 cm^2

2. In a square field, a quarter of a circle with a radius of 7 cm is designated as a water pool starting from each of its corners. What is the area of the remaining part of the grassy area within the field if each side of the field is 35 m?



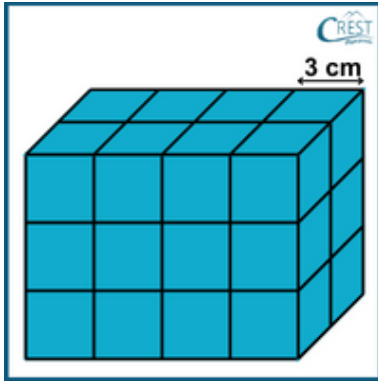
a. 1051 m^2
b. 1061 m^2
c. 1071 m^2
d. 1081 m^2

3. The circumference of a circular park is 264 metres and the width of the footpath around the park is 14 metres. what is the cost of fencing the outer circumference at the rate of \$5.82 per metre?

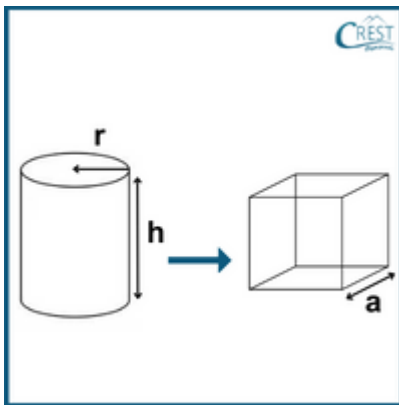


a. \$2028.24
b. \$2028.64
c. \$2048.24
d. \$2048.64

4. What is the total surface area of a cuboid if the side of a small cube is 3 cm?



- a. 428 cm
b. 448 cm
c. 468 cm
d. 488 cm
5. The radius and height of the pig iron cylindrical roll are 49 centimetres and 484 centimetres, respectively. The pig iron is melted in the furnace and a huge cube is formed. What is the lateral surface of a cube formed?



- a. 7.5 m^2
b. 9.5 m^2
c. 11.5 m^2
d. 13.5 m^2

Answer Key

1. a - 346.5 cm^2

Explanation: Length (l) of a rectangular paper = 37 cm

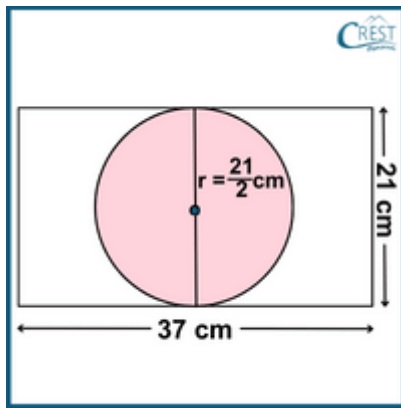
Breadth (b) of a rectangular paper = 21 cm

Largest circle which can be cut out of this paper with the largest diameter (d) is equal to the breadth (b) of a rectangular paper.

$$d = b$$

$$r = d/2 = b/2$$

$$= 21/2 \text{ cm}$$



Area of a largest circle = $\frac{22}{7} \times (21/2)^2$ [Area of a circle = πr^2 , where $\pi = \frac{22}{7}$]
 $= \frac{22}{7} \times (21/2) \times (21/2)$
 $= 346.5 \text{ cm}^2$

2. c - 1071 m^2

Explanation: Area of a square field = $a^2 = 35^2 = 1225 \text{ m}^2$

Four quadrants form a circle.

Area of four quadrants = Area of a circle [Area of a circle = πr^2 , where $\pi = \frac{22}{7}$]

$$= \frac{22}{7} \times (7)^2$$

$$= \frac{22}{7} \times 7 \times 7$$

$$= 154 \text{ m}^2$$

Area of the remaining part of the grassy area within the field

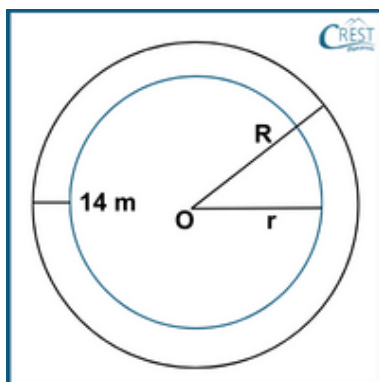
= Area of a square field – Area of four quadrants

$$= (1225 - 154) \text{ m}^2$$

$$= 1071 \text{ m}^2$$

3. d - \$2048.64

Explanation: The figure is:



Inner circumference of a circular park = 264 m

$$\Rightarrow 2\pi r = 264 \text{ m}$$

$$\Rightarrow 2 \times \frac{22}{7} \times r = 264 \text{ m} [\pi = \frac{22}{7}]$$

$$\Rightarrow r = 264 \times \frac{1}{2} \times \frac{7}{22}$$

$$\Rightarrow r = 264 \times \frac{1}{2} \times \frac{7}{22}$$

$$\Rightarrow r = 42 \text{ m}$$

Inner radius = $r = 42$ m

Outer radius = $R = r + 14$

$$= 42 + 14$$

$$= 56 \text{ m}$$

Outer circumference of a footpath around a circular park = $2\pi R$

$$= 2 \times \frac{22}{7} \times 56$$

$$= 352 \text{ m}$$

Cost of fencing the outer circumference of 1 m = \$5.82

$$\begin{aligned}\text{Cost of fencing the outer circumference of } 352 \text{ m} &= \$5.82 \times 352 \\ &= \$2048.64\end{aligned}$$

4. c - 468 cm

Explanation: Side of a small cube = 3 cm

Length (l) of a cuboid = $4 \times$ Side of a small cube = $4 \times 3 = 12$ cm

Breadth (b) of a cuboid = $2 \times$ Side of a small cube = $2 \times 3 = 6$ cm

Height (h) of a cuboid = $3 \times$ Side of a small cube = $3 \times 3 = 9$ cm

Total surface area of a cuboid = $2(lb + bh + hl)$

$$= 2(12 \times 6 + 6 \times 9 + 9 \times 12)$$

$$= 2(72 + 54 + 108)$$

$$= 2 \times 234$$

$$= 468 \text{ cm}$$

5. b - 9.5 m^2

Explanation: $r = 7$ cm

$h = 14$ cm

Volume of cylinder = $\pi r^2 h$

$$= \frac{22}{7} \times 49^2 \times 14$$

$$= \frac{22}{7} \times 49 \times 49 \times 14 \times 14$$

$$= \frac{22}{7} \times 49 \times 49 \times 14 \times 14$$

$$= (22 \times 14 \times 14 \times 7 \times 7 \times 7) \text{ cm}^3$$

Volume of an iron cube formed = Volume of cylinder

$$\Rightarrow a^3 = 22 \times 14 \times 14 \times 7 \times 7 \times 7$$

$$\Rightarrow a = 22 \times 7$$

$$\Rightarrow a = 154 \text{ cm}$$

Lateral surface area = $4 \times a^2$

$$= 4 \times (154)^2$$

$$= 4 \times 154 \times 154$$

$$= 94864 \text{ cm}^2$$

Lateral surface area in $\text{m}^2 = 94864 / (100 \times 100) \text{ m}^2$

$$= 9.4864 \text{ m}^2$$

$$= 9.5 \text{ m}^2 \text{ [Round off]}$$

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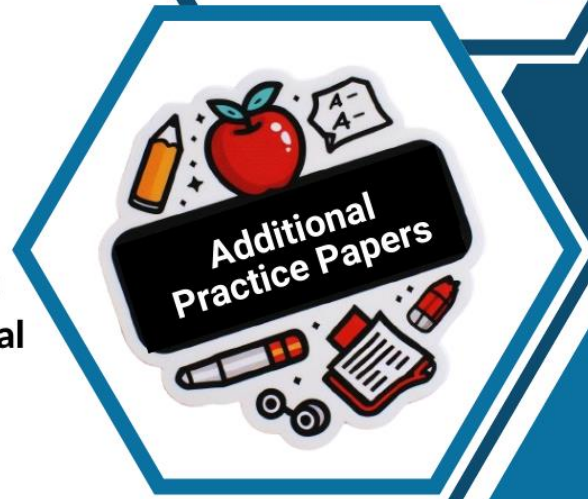
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