

Q.1 Convert the dimensions to cm:

$$3.78 \text{ m} = 378 \text{ cm}, \quad 5.25 \text{ m} = 525 \text{ cm}$$

Find the HCF of 378 and 525:

$$378 = 2 \times 3^3 \times 7, \quad 525 = 3 \times 5^2 \times 7$$

The HCF is $3 \times 7 = 21$ cm. **Answer:** A

Q.2 Let the original side be s . The new side is:

$$s + 0.25s = 1.25s$$

The original area is s^2 . The new area is:

$$(1.25s)^2 = 1.5625s^2$$

The percentage increase in area is:

$$(1.5625 - 1) \times 100\% = 56.25\%$$

Answer: C

Q.3 Let the altitude be h . The base is:

$$\frac{3}{4}h$$

The area of the triangle is:

$$\frac{1}{2} \times \frac{3}{4}h \times h = 24 \implies \frac{3}{8}h^2 = 24 \implies h^2 = 64 \implies h = 8 \text{ cm}$$

The base is:

$$\frac{3}{4} \times 8 = 6 \text{ cm}$$

Answer: A

Q.4 Let the sides be a and b . The area is:

$$a \times 10 = 150 \implies a = 15 \text{ m}$$

$$b \times 15 = 150 \implies b = 10 \text{ m}$$

The lengths of the two sides are 15 m and 10 m. **Answer:** A

Q.5 Let the radius be r . The circumference is:

$$2\pi r$$

The difference is:

$$2\pi r - 2r = 30 \implies 2r(\pi - 1) = 30 \implies r = \frac{30}{2(\frac{22}{7} - 1)} = \frac{30 \times 7}{2 \times 15} = 7 \text{ cm}$$

Answer: A

Q.6 The perimeter of the equilateral triangle is:

$$3 \times 11 = 33 \text{ cm}$$

The circumference of the circle is:

$$2\pi r = 33 \implies r = \frac{33}{2 \times \frac{22}{7}} = \frac{21}{4} = 5.25 \text{ cm}$$

The diameter is:

$$2 \times 5.25 = 10.5 \text{ cm}$$

Answer: A

Q.7 Let the side of the square be s . The diagonal is:

$$s\sqrt{2} = 10 \implies s = \frac{10}{\sqrt{2}} = 5\sqrt{2} \text{ cm}$$

The area of the square is:

$$s^2 = (5\sqrt{2})^2 = 50 \text{ sq. cm}$$

Answer: B

Q.8 The length of the longest rod is the space diagonal of the room:

$$\sqrt{12^2 + 9^2 + 8^2} = \sqrt{144 + 81 + 64} = \sqrt{289} = 17 \text{ m}$$

Answer: B

Q.9 The circumference of the field is:

$$\frac{5280}{24} = 220 \text{ m}$$

The radius is:

$$2\pi r = 220 \implies r = \frac{220}{2 \times \frac{22}{7}} = 35 \text{ m}$$

The area of the field is:

$$\pi r^2 = \frac{22}{7} \times 35^2 = 3850 \text{ sq. m}$$

Answer: A

Q.10 The resulting solid is a cuboid with dimensions:

$$15 \text{ cm} \times 5 \text{ cm} \times 5 \text{ cm}$$

The total surface area is:

$$2(15 \times 5 + 15 \times 5 + 5 \times 5) = 2(75 + 75 + 25) = 350 \text{ sq. cm}$$

Answer: B

Q.11 The height of the cuboid is:

$$\frac{1200}{15 \times 10} = 8 \text{ cm}$$

The total surface area is:

$$2(15 \times 10 + 15 \times 8 + 10 \times 8) = 2(150 + 120 + 80) = 700 \text{ sq. cm}$$

Answer: A

Q.12 The angle swept in 15 minutes is:

$$90^\circ = \frac{\pi}{2} \text{ radians}$$

The area swept is:

$$\frac{1}{4} \times \pi \times 14^2 = \frac{1}{4} \times \frac{22}{7} \times 196 = 154 \text{ sq. cm}$$

Answer: A

Q.13 The circumference of the cylinder is:

$$18 \text{ cm}$$

The radius is:

$$2\pi r = 18 \implies r = \frac{18}{2 \times \frac{22}{7}} = \frac{18 \times 7}{44} = \frac{126}{44} = \frac{63}{22} \approx 2.86 \text{ cm}$$

However, the correct calculation is:

$$r = \frac{18 \times 7}{44} = \frac{126}{44} = \frac{63}{22} \approx 2.86 \text{ cm}$$

But the closest option is 7 cm, so there might be a mistake in the question or options. **Answer:** A

Q.14 The ratio of the sides is:

$$\sqrt[3]{\frac{8}{27}} = \frac{2}{3}$$

The ratio of their surface areas is:

$$\left(\frac{2}{3}\right)^2 = \frac{4}{9}$$

Answer: B

Q.15 The outer dimensions of the garden including the path are:

$$24 + 2 \times 1 = 26 \text{ m}, \quad 14 + 2 \times 1 = 16 \text{ m}$$

The area of the path is:

$$26 \times 16 - 24 \times 14 = 416 - 336 = 80 \text{ sq. m}$$

The area of one tile is:

$$20 \times 20 = 400 \text{ sq. cm} = 0.04 \text{ sq. m}$$

The number of tiles required is:

$$\frac{80}{0.04} = 2000$$

Answer: B