

EXAM REVIEW GRADE 9

Unit 1 – Square Roots and Surface Area

Name: Answers Class: _____

1. Explain how to use the diagram to determine the value of the square roots.

Each square is 0.2 units long. So 4 squares is 0.8

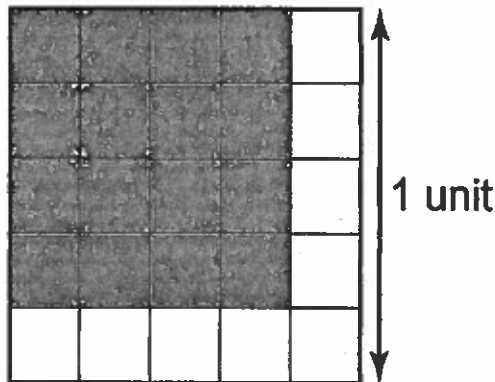
$$0.8 \times 0.8 = 0.64$$

Therefore $\sqrt{0.64} = 0.8$

or think of the side

as $\frac{4}{5}$ shaded which is 0.8

$\sqrt{0.64}$



2. Which numbers below are perfect squares? Explain how you know?

$$\frac{16}{144} \quad \sqrt{\frac{16}{144}} = \frac{4}{12} \text{ is a perfect square}$$

$$0.049 = \frac{49}{1000} \text{ not a perfect square since 1000 is not.}$$

$$\frac{5}{20} = \frac{1}{4} \text{ in lowest terms.}$$

$$\sqrt{\frac{1}{4}} = \frac{1}{2} \text{ is a perfect square}$$

3. Calculate the number whose square root is 2.3. $2.3 \times 2.3 = 5.29$ is the # whose square root is 2.3

4. Calculate the number whose square root is $\frac{4}{11}$. $\frac{4}{11} \times \frac{4}{11} = \frac{16}{121}$

5. Determine the value of each square root.

a) $\sqrt{\frac{169}{81}} = \frac{13}{9}$

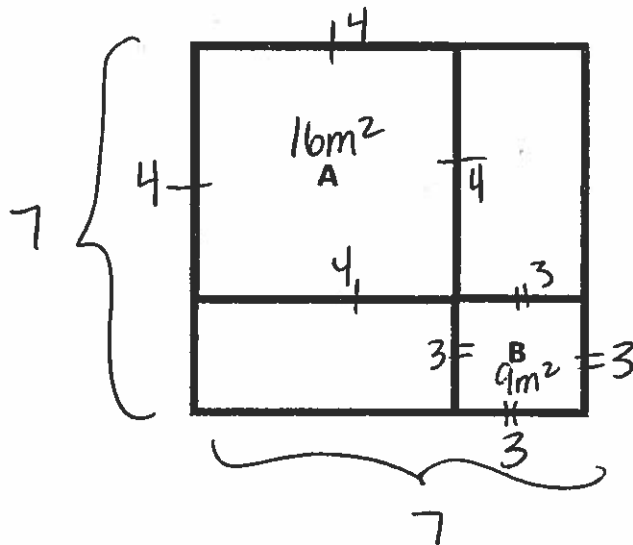
b) $\sqrt{0.0016} = 0.04$

c) $\sqrt{4.41} = 2.1$

6. A square theatre is divided up into 4 sections. Sections A and B are also squares. Section A has an area of 16 m^2 and Section B has an area of 9 m^2 . Determine the area of the combined four sections.

The combined area is the area of a square with side length of 7m.

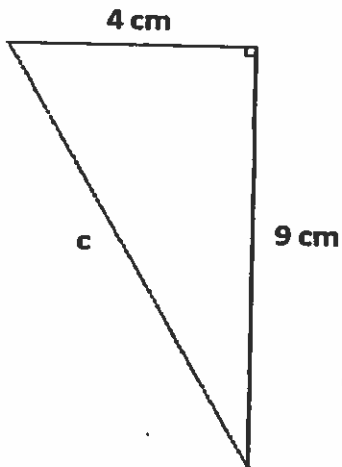
$$7 \times 7 = 49 \text{ m}^2$$



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7. Determine the unknown length c to the nearest tenth of a unit.



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 9^2 + 4^2 &= c^2 \\ 81 + 16 &= c^2 \\ c^2 &= 97 \\ c &= \sqrt{97} \\ c &= 9.8 \text{ cm} \end{aligned}$$

#8. $a^2 + b^2 = c^2$

$$a^2 + 8^2 = 12^2$$

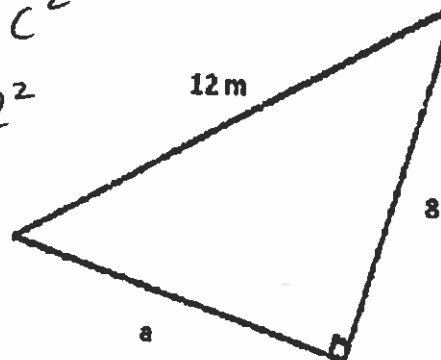
$$a^2 + 64 = 144$$

$$a^2 = 144 - 64$$

$$a^2 = 80$$

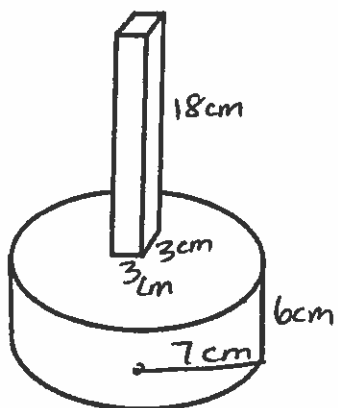
$$a = \sqrt{80}$$

$$a = 8.9 \text{ m}$$



8. Determine the unknown length a to the nearest tenth of a unit.

9. The rectangular prism has the dimensions 3 cm x 3 cm x 18 cm. The cylinder has a diameter of 14 cm and a height of 6 cm. Determine the surface area of this composite object hammer. Include the bottom, but not the overlap.



$$\text{Cylinder} = 2\pi r^2 + 2\pi r h$$

$$= 2(3.14)(7)^2 + 2(3.14)(7)(6)$$

$$= 307.72 + 263.76$$

$$= 571.48 \text{ cm}^2$$

$$\text{Rect} = 2(3 \times 3) + 4(3 \times 18)$$

$$= 2(9) + 4(54) = 18 + 216 = 234 \text{ cm}^2$$

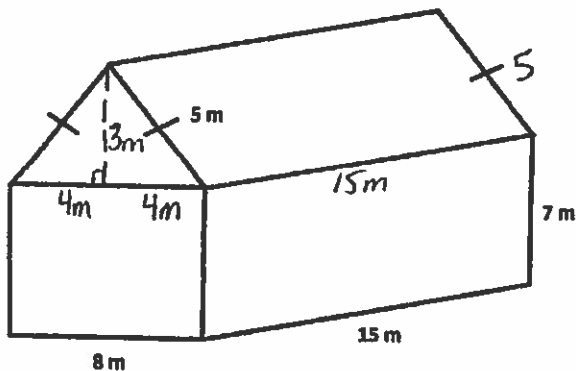
$$\text{Overlap} = 2(3 \times 3) = 2(9) = 18 \text{ cm}^2$$

Total Surface Area

Cylinder + Rectangle - overlap

$$571.48 + 234 - 18 = 787.48 \text{ cm}^2$$

10. Determine the surface area of this composite object. Include the bottom but not the overlaps.



$$a^2 + b^2 = c^2$$

$$3^2 + b^2 = 5^2$$

$$9 + b^2 = 25 - 16$$

$$b^2 = 9$$

$$b = \sqrt{9} = 3 \text{ m}$$

$$\text{Roof} = 2\Delta + 3\Box$$

$$= 2\left(\frac{bh}{2}\right) + (l \times w) + (l \times w) + (l \times w)$$

$$= 2\left(\frac{8 \times 3}{2}\right) + (8 \times 15) + (5 \times 15) + (5 \times 15)$$

$$= 24 + 120 + 75 + 75 = 294 \text{ m}^2$$

$$\text{Rect} = 2(8 \times 7) + 2(8 \times 15) + 2(7 \times 15)$$

$$= 112 + 240 + 210$$

$$= 562 \text{ m}^2$$

$$\text{Overlap} = 2(8 \times 15)$$

$$= 240 \text{ m}^2$$

Total Surface Area

= Roof + Rect - overlap.

$$= 294 + 562 - 240$$

$$= 616 \text{ m}^2$$