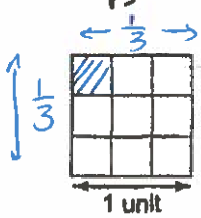
Mathematics **Name:** ____________________

Unit 1 review sheet

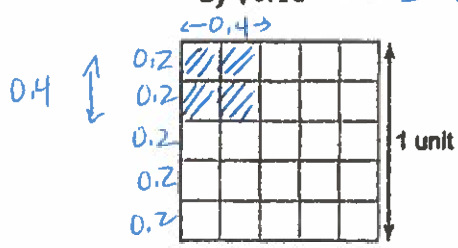
Complete the following in the space provided. Show all workings.

1. Use each diagram to determine the value of the square root.

a) $\sqrt{\frac{1}{9}} = \frac{1}{3}$



b) $\sqrt{0.16} = 0.4$



or think $\frac{2}{5}$ shaded $= 0.4$

2. Which numbers below are perfect squares? How do you know?

a) $\frac{25}{121}$ since $\sqrt{\frac{25}{121}} = \frac{5}{11}$ Yes, perfect square

b) $\frac{2}{50} = \frac{1}{25}$ yes perfect square $\sqrt{\frac{1}{25}} = \frac{1}{5}$

c) $0.004 = \frac{4}{1000}$ Not a perfect square or $\sqrt{0.004} = 0.063245553$ nonterminating nonrepeating

3. Calculate the number whose square root is:

a) $\frac{5}{7}$ $\frac{5}{7} \times \frac{5}{7} = \frac{25}{49}$

b) 1.6 $1.6 \times 1.6 = 2.56$

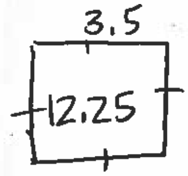
4. Determine the value of each square root.

a) $\sqrt{\frac{225}{49}} = \frac{15}{7}$

b) $\sqrt{6.76}$ $= 2.6$

c) $\sqrt{0.0025}$ $= 0.05$

side $= \sqrt{12.25}$
$= 3.5$



5. The area of a square garden is 12.25 m^2. (Use a diagram to help you.)

a) Determine the perimeter of the garden. $3.5 \times 4 = 14m$

b) The owner decides to put a gravel pathway around the garden.
This reduces the area of the garden by 4.96 m^2.
What is the new side length of the garden? $12.25 - 4.96$
$= 7.29$

new side
$\sqrt{7.29} = 2.7m$

6. Use benchmarks to approximate each square root to the nearest tenth.

a) $\sqrt{11.6}$

3   3.4   4

$\sqrt{9}$ 11.6 $\sqrt{16}$

~ 3.4

$$\begin{array}{r} 3.4 \\ \times 3.4 \\ \hline 11.56 \end{array}$$

b) $\sqrt{0.39}$

0.6   0.62   0.7

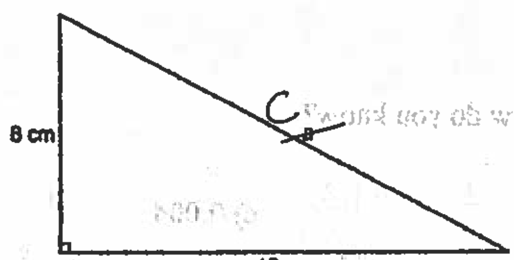
$\sqrt{0.36}$ $\sqrt{0.39}$ $\sqrt{0.49}$

$\sqrt{0.39} \sim 0.62$

$$\begin{array}{r} 0.62 \\ \times 0.62 \\ \hline 0.3844 \end{array}$$

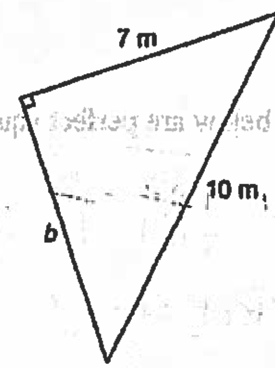
7. In each triangle, determine the unknown length to the nearest tenth of a unit where necessary.

a)



$a^2 + b^2 = c^2$
$8^2 + 15^2 = c^2$
$64 + 225 = c^2$
$c^2 = 289$
$c = \sqrt{289} = 17cm$

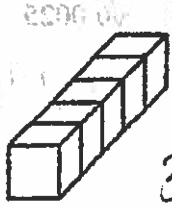
b)



$a^2 + b^2 = c^2$
$7^2 + b^2 = 10^2$
$49 + b^2 = 100$
$b^2 = 100 - 49$
$b^2 = 51$
$b = \sqrt{51}$
$b = 7.1m$

8. Each cube has edge length 1 unit. Determine the surface area of each object.

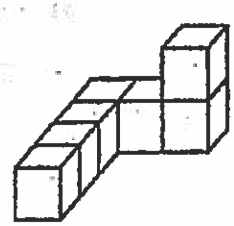
a)



$5 \times 6 = 30$
$4 \times 2 = 8$

$30 - 8$
$= 22 \text{ units}^2$

b)



$7 \times 6 = 42$
$6 \times 2 = 12$

$42 - 12 = 30 \text{ units}^2$

9. Estimate $\sqrt{\frac{38}{7}}$. Do not use a calculator. Explain the strategy you used.

$\sim \frac{\sqrt{36}}{\sqrt{9}} = \frac{6}{3} = 2$

10. The local curling rink is shown in the diagram at the right. It is to be painted.

a) Determine the surface area of the structure.

b) The roof, windows, and door are not to be painted. The door is 1 m by 2 m and the window is 4 m by 2 m. Determine the surface area to be painted.

c) A can of paint covers 300 m^2 and costs \$45. Determine the cost of the paint needed.

a) SA of full structure

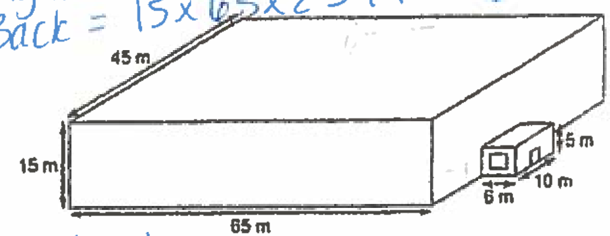
Lg rectangle

Top/Bottom = $45\times65\times2 = 5850$

Left/Right = $15\times45\times2 = 1350$

Front/Back = $15\times65\times2 = 1950$

] $9150\,m^2$



small rectangle

Top/Bottom = $6\times10\times2 = 120$

Left/Right = $5\times10\times2 = 100$

Front/Back = $6\times5\times2 = 60$

] $280\,m^2$

overlap $= 5\times10\times2 = 100$

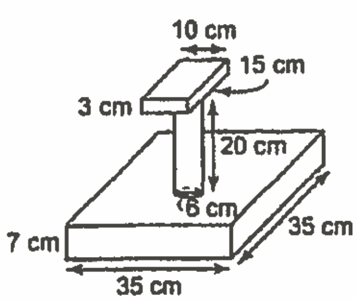
Bottom of building $= 45\times65 = 292$

Bottom of porch $= 6\times10 = 60$.

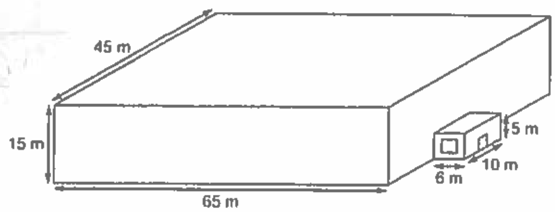
$SA = 9150 + 280 - 100 - 2925 - 60$

$= 6345\ m^2$

11. Determine the surface area of this composite object to the nearest tenth of a square centimetre. The diameter of the cylinder is 6 cm.



Hockey Rink Example



Door is 4m by 2m. (area $= 4 \times 2 = 8m^2$)
Window is 1 m by 2m. (area $= 1 \times 2 = 2m^2$)

b) Find the surface area that needs to be painted. Exclude the roof, floor, window and door.

RINK (not including floor or roof)

Surface Area = area of left + area of right side + area of front + area of back

$= (15 \times 45) + (15 \times 45)$
$(15 \times 65) + (15 \times 65)$

$= 675 + 675 + 975 + 975$
$= 3300\ m^2$

ENTRANCE (excluding floor, roof, window, door)

Surface Area = area of left + area of right + area of front + area of back

$$= (5\times10)+(5\times10)+(6\times5)+(6\times5)$$
$$= 50+50+30+30$$
$$= 160\,m^2$$

subtract window and door
($2m^2$) ($8m^2$)

$$= 160-2-8$$
$$S.A. = 150\,m^2$$

OVERLAP

$$\text{area} = (5\times10)\times2$$
$$= 50\times2$$
$$= 100\,m^2$$

Total Surface Area
= area of the rink + entrance area
− overlap area.

$$= 3300+150-100$$
$$= 3350\,m^2$$

c) # of cans needed $= \frac{3350}{300} = 11.2 \sim 12$ cans

$12 \times 45 = \$540$

11. small rectangle

$10 \times 3 \times 2 = 60$
$15 \times 3 \times 2 = 90$
$10 \times 15 \times 2 = 300$
$\Big\}$ $450\ cm^2$

large rectangle

$7 \times 35 \times 2 = 490$
$35 \times 35 \times 2 = 2450$
$7 \times 35 \times 2 = 490$
$\Big\}$ $3430\ cm^2$

cylinder

$= 2\pi r^2 + 2\pi rh$
$= 2(3.14)(3)^2 + 2(3.14)(3)(20)$
$= 56.52 + 376.8$
$= 433.32\ cm^2$

overlap

= 4 circles
$= 4\pi r^2$
$= 4(3.14)(3)^2$
$= 113.04$

Total SA $= 450 + 3430 + 433.32 - 113.04$
$= 4200.28\ cm^2$