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

a) $\frac{25}{121}$ b) 2.89   c) $\frac{2}{50}$ d) 0.004

2. Calculate the number whose square root is:

a) $\frac{5}{7}$ b) 1.6   c) 0.92   d) $\frac{10}{9}$

3. Determine the value of each square root.

a) $\sqrt{\frac{225}{49}}$ b) $\sqrt{\frac{9}{25}}$ c) $\sqrt{\frac{400}{324}}$ d) $\sqrt{\frac{4}{49}}$

4. Determine the value of each square root.

a) $\sqrt{6.76}$ b) $\sqrt{327.61}$ c) $\sqrt{0.0025}$ d) $\sqrt{0.0225}$

5. The area of a square garden is 12.25 m².

a) Determine the perimeter of the garden.
b) The owner decides to put a gravel pathway around the garden.
   This reduces the area of the garden by 4.96 m².
   What is the new side length of the garden?

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

a) $\sqrt{\frac{16}{53}}$ b) $\sqrt{\frac{1}{25}}$ c) $\sqrt{0.009}$ d) $\sqrt{10.24}$

State the benchmark(s) you could use to approximate each square root.

a) $\sqrt{29}$ b) $\sqrt{0.41}$ c) $\sqrt{\frac{18}{37}}$ d) $\sqrt{\frac{14}{3}}$

**8.** Use benchmarks to approximate each square root to the nearest tenth.

a) $\sqrt{11}$ b) $\sqrt{0.39}$ c) $\sqrt{\frac{21}{8}}$ d) $\sqrt{\frac{11}{52}}$

9. Suppose the $\sqrt{\ }$ key on your calculator is broken. Explain how you could use your calculator to estimate $\sqrt{58.6}$ to the nearest tenth.
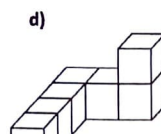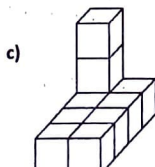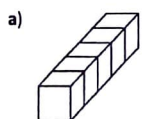
10. Use a calculator to approximate each square root to the nearest tenth.

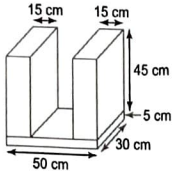a) $\sqrt{14.29}$ b) $\sqrt{\frac{15}{8}}$ c) $\sqrt{\frac{2}{19}}$ d) $\sqrt{0.7}$

11. In each triangle, determine the unknown length to the nearest tenth of a unit where necessary. $a^2 + b^2 = c^2$

a)

8 cm

a

15 cm

b)

7 m

10 m

b
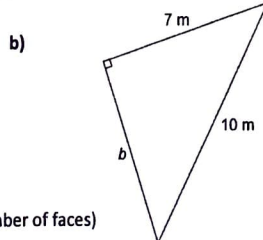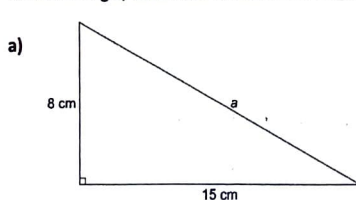
12. Each cube has edge length 1 unit. (or find the number of faces)
Determine the surface area of each object.

a)   b)   c)   d)

13. Determine the surface area of this composite object.

15 cm   15 cm

45 cm

5 cm

30 cm

50 cm

**14.** 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 m² and costs $45. Determine the cost of the paint needed.

45 m

15 m

65 m

5 m

10 m

6 m
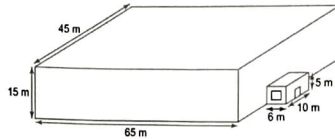
15. Determine the surface area of each composite object to the nearest tenth of a square centimetre where necessary.

a)

3 cm

4 cm   3 cm

2 cm

5 cm

20 cm

20 cm

b)

10 cm

15 cm

3 cm

20 cm

6 cm

7 cm

35 cm

35 cm
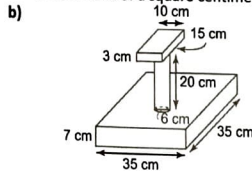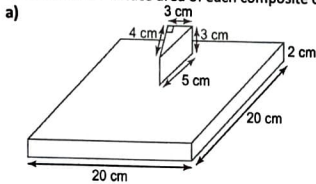
16. Determine the surface area of the composite object at the right to the nearest square metre.

2 m

10 m

3 m

8 m

5 m
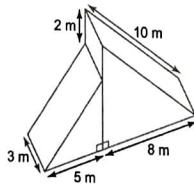
Answers

1. a) Yes, both 25 and 121 are perfect squares. **b)** Yes, $\sqrt{2.89} = \sqrt{\frac{289}{100}} = \frac{17}{10}$ **c)** Yes, $\frac{2}{50} = \frac{4}{100}$ and $\sqrt{\frac{4}{100}} = \frac{2}{10} = 0.2$

d) No, $0.004 = \frac{4}{1000}$ and 1000 is not a perfect square.

2. a) $\frac{25}{49}$ **b)** 2.56 **c)** 0.8464 **d)** $\frac{100}{81}$ **3. a)** $\frac{15}{7}$ **b)** $\frac{3}{5}$ **c)** $\frac{20}{18}$, or $\frac{10}{9}$ **d)** $\sqrt{\frac{4}{49}} = \frac{2}{7}$ **4. a)** 2.6 **b)** 18.1 **c)** 0.05 **d)** 0.15

5. a) Side length in metres = $\sqrt{12.25} = 3.5$
So, perimeter of garden is 4 × 3.5 m, or 14 m.

b) New area of garden: 12.25 m² – 4.96 m² = 7.29 m²
New side length in metres:
$\sqrt{7.29} = 2.7$

6. a) No, 53 is not a perfect square. **b)** Yes, both 1 and 25 are perfect squares. **c)** No, $\sqrt{0.009} = \sqrt{\frac{9}{1000}}$, and 1000 is not a perfect square. **d)** Yes, $\sqrt{10.24} = \sqrt{\frac{1024}{100}}$ and both 1024 and 100 are perfect squares.

7. a) $\sqrt{25} = 5$ and $\sqrt{36} = 6$ **b)** $\sqrt{0.36} = 0.6$ and $\sqrt{0.49} = 0.7$ **c)** $\frac{16}{37}$ $\frac{16}{36}$ **d)** $\frac{14}{3}$ $\sqrt{4}$

8. a) $\sqrt{11}$ is between $\sqrt{9} = 3$ and $\sqrt{16} = 4$, but closer to 3. Try 3.4: $3.4^2 = 11.56$. So, $\sqrt{11.6} \doteq 3.4$

b) $\sqrt{0.39}$ is between $\sqrt{0.36} = 0.6$ and $\sqrt{0.49} = 0.7$, but closer to 0.6, so try 0.62.

c) $\sqrt{\frac{21}{2}} = \sqrt{10.5}$ and $\sqrt{10.5}$ is between $\sqrt{9} = 3$ and $\sqrt{16} = 4$, but closer to 3.

Try 3.2: $3.2^2 = 10.24$, which
is close.

So, $\sqrt{\frac{21}{2}} \doteq 3.2$

d) $\sqrt{\frac{11}{52}} \doteq \sqrt{\frac{13}{52}} \doteq \sqrt{\frac{1}{4}}$, which

is $\frac{1}{2}$.

So, $\sqrt{\frac{11}{52}} \doteq 0.5$

9. I could use guess and test. I could use the benchmarks $\sqrt{49} = 7$ and $\sqrt{64} = 8$. Since 58.6 is a little closer to 64, try 7.7. $7.7^2 = 59.29$, which is close. So, $\sqrt{58.6} \doteq 7.7$

10. a) 3.8 b) 1.4 c) 0.3 d)0.8 **11.a)**17 cm **b)** 7.1 m **12. a)** 22 faces or unit² **b)** 18 faces or unit² **c)**36 faces or unit² **d)**30 faces or unit² **13.** 11 900 cm² **14.a)**6345m² **b)**3410m² **c)**12 cans that cost $540 **15. a)**996cm² **b)** 4200.4cm² **16.** 162.2 m²

<u>Math9A – Midterm2 Review – Ch 7 (Scale Factor, Similar Shapes)</u>   Name: _____

$$Scale\ Factor = \frac{Scale}{Original} \quad AKA \quad Scale\ Factor = \frac{Enlargement}{Original} \quad OR \quad Scale\ Factor = \frac{Reduction}{Original}$$

1. A photo has dimensions 17.5cm by 14.3cm. The photo is to be enlarged by a scale factor of 3.5. Calculate the dimensions of the enlargement.

2. Determine the scale factor of this reduction .
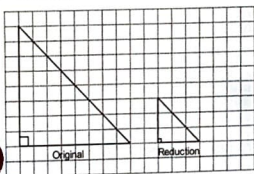
3. A circle has a diameter of 48cm. The diameter of the reduction (scale diagram) is 42cm. Determine the scale factor.

*(The 2 lengths must be in the same units).

4. A luxury cruise ship is 38m long. A model of this ship is 15.2cm long. **Note: (1m =100cm)**
a) Determine the scale factor of the model.

b) A Boeing 787 plane is 57m long. Determine the length of a model of the plane using the same scale factor from 4a.

5. Which of the trapezoids, A, B, C, D are scale diagrams of Trapezoid O? Show your scale factor work to confirm.
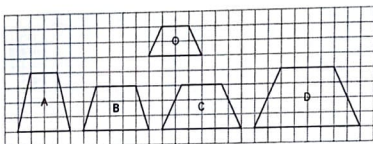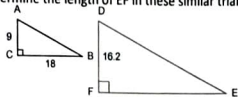

6. Determine the value of y in this proportion. $\frac{y}{2.7} = \frac{2.8}{16.8}$
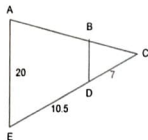
7. Calculate the values of x and y in this proportion.

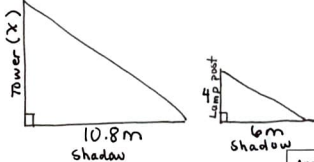$$\frac{x}{13.2} = \frac{8.5}{13.6} = \frac{6.9}{y}$$

8. Determine the length of EF in these similar triangles.

9. Determine the length of BD in these similar triangles.

10. When the shadow of an electrical tower is 10.8m long, a 4m lamp post casts a shadow 6m long.
How tall is the electrical tower?

Answers: 1= 61.25cm by 50.05cm 2= 3/8 = 0.375 3= 42/48 = 0.875
4A= 15.2/3800 = 0.004 4b= 0.228m = 22.8cm
5= C (SF of 1.5) and D (SF of 2) 6= 0.45 7= x=8.25 y=11.04 8= 32.4
9=8 10= 7.2m