

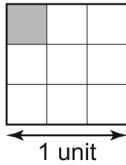
Master 1.16

Extra Practice 1

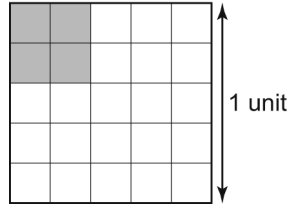
Lesson 1.1: Square Roots of Perfect Squares

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

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



b) $\sqrt{0.16}$



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

a) $\frac{25}{121}$

b) 2.89

c) $\frac{2}{50}$

d) 0.004

3. Calculate the number whose square root is:

a) $\frac{5}{7}$

b) 1.6

c) 0.92

d) $\frac{10}{9}$

4. Determine the value of each square root.

a) $\sqrt{\frac{225}{49}}$

b) $\sqrt{\frac{9}{25}}$

c) $\sqrt{\frac{400}{324}}$

d) $\sqrt{\frac{8}{9}}$

5. Determine the value of each square root.

a) $\sqrt{6.76}$

b) $\sqrt{327.61}$

c) $\sqrt{0.0025}$

d) $\sqrt{0.0225}$

6. The area of a square garden is 12.25 m^2 .

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 m^2 .

What is the new side length of the garden?

Master 1.17

Extra Practice 2

Lesson 1.2: Square Roots of Non-Perfect Squares

1. 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) $\sqrt{10.24}$

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

a) $\sqrt{29.4}$ b) $\sqrt{0.41}$ c) $\sqrt{\frac{18}{37}}$ d) $\sqrt{\frac{14}{3}}$

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

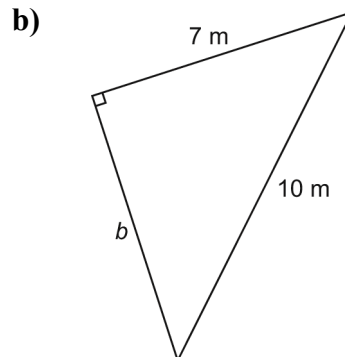
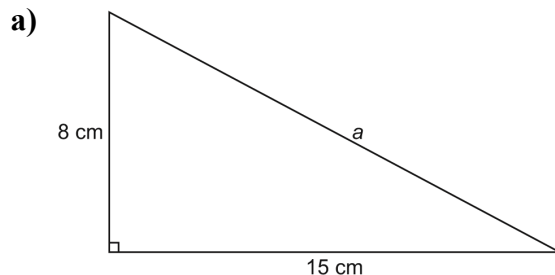
a) $\sqrt{11.6}$ b) $\sqrt{0.39}$ c) $\sqrt{\frac{21}{2}}$ d) $\sqrt{\frac{11}{52}}$

4. Suppose the $\sqrt{\quad}$ key on your calculator is broken. Explain how you could use your calculator to estimate $\sqrt{58.6}$ to the nearest tenth.

5. 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) $\sqrt{0.7}$

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



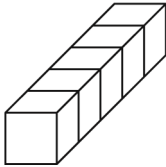
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Extra Practice 3

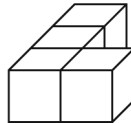
Lesson 1.3: Surface Areas of Objects Made from Right Rectangular Prisms

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

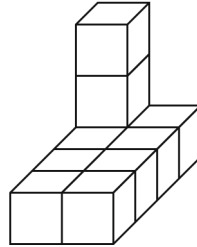
a)



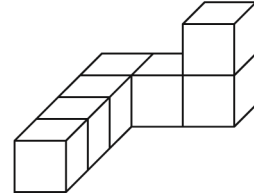
b)



c)

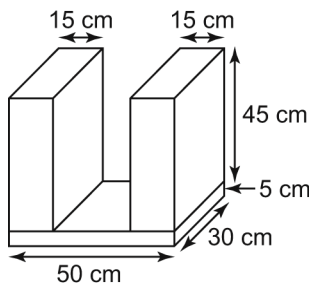


d)



2. Each edge of a linking cube is 1 unit long. Build a composite object with 7 linking cubes. Exchange objects with a classmate. Determine the surface area of your classmate's object. Check each other's work.

3. Determine the surface area of this composite object.

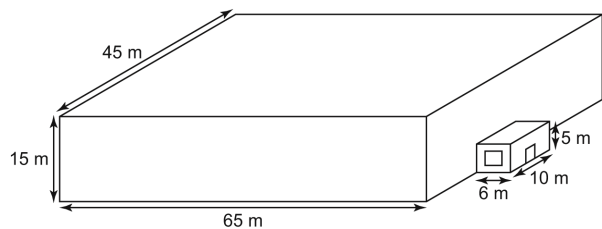


4. The local curling rink is shown in the diagram at the right. It is to be painted.

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.

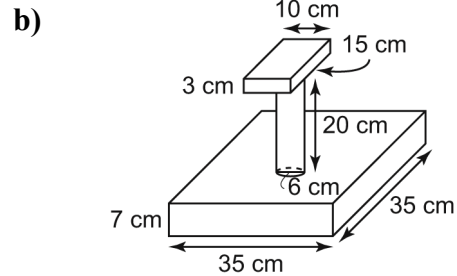
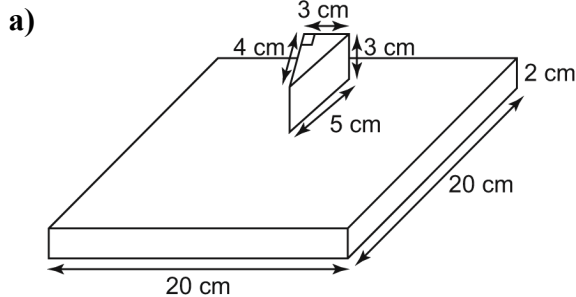


Master 1.19

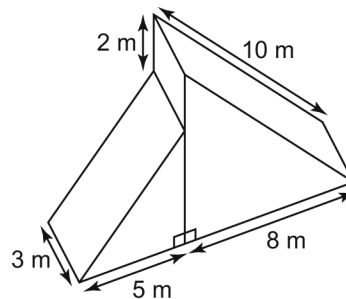
Extra Practice 4

Lesson 1.4: Surface Areas of Other Composite Objects

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

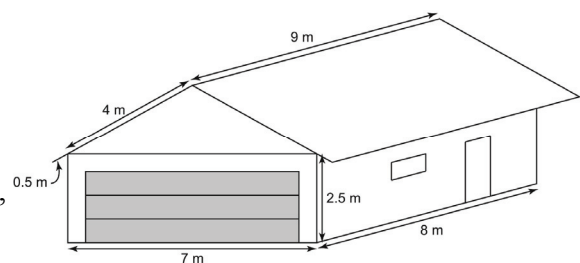


2. Determine the surface area of the composite object at the right to the nearest square metre.



3. Suppose the diagram in question 2 is part of a structure at a snowboarding park.
- What changes, if any, would you make in calculating the surface area of this object?
 - The structure is to be covered on the top sections (where a boarder would be riding) with a special “carpet for summer sliding.” Calculate the area of carpet that would be needed.

4. Jeanne is helping her dad with his stucco business for the summer. Since Jeanne has studied surface area in school, she does some estimates for her dad’s business. For the garage at the right, they plan to stucco the walls. They will not stucco the roof, car door, side door, or window. The car door measures 5 m by 2.3 m, the side door measures 2.1 m by 0.9 m, and the window measures 1 m by 0.7 m. Determine the surface area to be covered with stucco to the nearest square metre.



Master 1.20

Extra Practice Sample Answers

Extra Practice 1 – Master 1.16

Lesson 1.1

- $\frac{1}{3}$
 - 0.4
- Yes, both 25 and 121 are perfect squares.
 - Yes, $\sqrt{2.89} = \sqrt{\frac{289}{100}} = \frac{17}{10}$
 - Yes, $\frac{2}{50} = \frac{4}{100}$ and $\sqrt{\frac{4}{100}} = \frac{2}{10} = 0.2$
 - No, $0.004 = \frac{4}{1000}$ and 1000 is not a perfect square.
- $\frac{25}{49}$
 - 2.56
 - 0.8464
 - $\frac{100}{81}$
- $\frac{15}{7}$
 - $\frac{3}{5}$
 - $\frac{20}{18}$, or $\frac{10}{9}$
 - $\sqrt{\frac{8}{98}} = \sqrt{\frac{4}{49}} = \frac{2}{7}$
- 2.6
 - 18.1
 - 0.05
 - 0.15
- Side length in metres = $\sqrt{12.25} = 3.5$
So, perimeter of garden is 4×3.5 m, or 14 m.
 - New area of garden: $12.25 \text{ m}^2 - 4.96 \text{ m}^2 = 7.29 \text{ m}^2$
New side length in metres:
 $\sqrt{7.29} = 2.7$
- Yes, $\sqrt{10.24} = \sqrt{\frac{1024}{100}}$ and both 1024 and 100 are perfect squares.
- $\sqrt{25} = 5$ and $\sqrt{36} = 6$
 - $\sqrt{0.36} = 0.6$ and $\sqrt{0.49} = 0.7$
 - $\sqrt{\frac{18}{37}} \doteq \sqrt{\frac{16}{36}}$
 - $\sqrt{\frac{14}{3}} \doteq \sqrt{4}$
- $\sqrt{11.6}$ is between $\sqrt{9} = 3$ and $\sqrt{16} = 4$, but closer to 3. Try 3.4: $3.4^2 = 11.56$.
So, $\sqrt{11.6} \doteq 3.4$
 - $\sqrt{0.39} \doteq \sqrt{0.36} = \sqrt{\frac{36}{100}} = \frac{6}{10} = 0.6$
 - $\sqrt{\frac{21}{2}} = \sqrt{10.5}$ 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, $\sqrt{\frac{21}{2}} \doteq 3.2$
 - $\sqrt{\frac{11}{52}} \doteq \sqrt{\frac{13}{52}} = \sqrt{\frac{1}{4}}$, which is $\frac{1}{2}$.
So, $\sqrt{\frac{11}{52}} \doteq 0.5$
- 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, $\sqrt{58.6} \doteq 7.7$
- 3.8
 - 1.4
 - 0.3
 - 0.8
- 17 cm
 - 7.1 m

Extra Practice 2 – Master 1.17

Lesson 1.2

- No, 53 is not a perfect square.
 - Yes, both 1 and 25 are perfect squares.
 - No, $\sqrt{0.009} = \sqrt{\frac{9}{1000}}$, and 1000 is not a perfect square.

Extra Practice 3 – Master 1.18

Lesson 1.3

- 22 unit²
 - 18 unit²
 - 36 unit²
 - 30 unit²
- Answers will vary.
- 11 900 cm²

Master 1.21**Extra Practice and Activating Prior Knowledge
Sample Answers**

4. a) 6345 m^2 b) 3350 m^2
c) 11.2 cans, or 12 cans of paint are needed. The cost of the paint is \$540.

Extra Practice 4 – Master 1.19**Lesson 1.4**

1. a) 996 cm^2 b) 4200.4 cm^2
2. 162 m^2
3. a) The surface area of the base, 39 m^2 , would not be included. So, the surface area would now be 123 m^2 .
b) Only the oblique faces of the structure would be included; 49 m^2 .
4. 74 m^2

**Activating Prior Knowledge
Master 1.22a**

1. a) 36, 49, 144
b) 36 can be shown as a square with side length 6 units; 49 as a square with side length 7 units, and 144 as a square with side length 12 units.
2. a) Answers may vary; for example, 4, 81, 121; they can each be written as the product of 2 equal factors.
b) Answers may vary; for example, 27, 39, 88; each number cannot be written as the product of 2 equal factors.

**Activating Prior Knowledge
Master 1.22b**

1. a) 92 cm^2
b) 252 cm^2
2. 2035.8 cm^2

Activating Prior Knowledge**Perfect Square Whole Numbers****Quick Review**

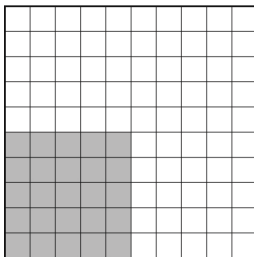
A number is a perfect square if it can be represented as the area of a square.
It can be written as the product of two equal factors.

Example

- a) Which numbers below are square numbers?
 i) 25 ii) 24 iii) 20
- b) Illustrate each square number in part a.

Solution

- a) i) $25 = 5 \times 5$, so 25 is a square number.
 ii) $24 = 1 \times 24$, or 2×12 , or 3×8 , or 4×6
 24 is not a square number.
 iii) $20 = 1 \times 20$, or 2×10 , or 4×5
 20 is not a square number.
- b) i) 25 can be shown as a square with side length 5 units.

**Check**

1. a) Which numbers below are square numbers?
 i) 15 ii) 36 iii) 49 iv) 80 v) 144
- b) Use grid paper to illustrate each number in part a.
2. a) Write 3 different numbers that are perfect squares.
 Explain how you know they are perfect squares.
- b) Write 3 different numbers that are not perfect squares.
 Explain how you know they are not perfect squares.

Master 1.22b

Activating Prior Knowledge

Surface Areas of Right Prisms and Right Cylinders Quick Review

The surface area of a right rectangular prism is:

$$2 \times \text{area of top face} + 2 \times \text{area of front face} + 2 \times \text{area of side face}$$

The surface area of a right triangular prism is:

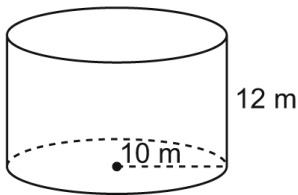
$$\text{Sum of the areas of the rectangular faces} + 2 \times \text{area of triangular base}$$

The surface area of a right cylinder is:

$$2 \times \text{area of circular base} + \text{circumference of base} \times \text{height of cylinder}$$

Example

Determine the surface area of this cylinder to the nearest tenth of a square metre.

**Solution**

The area of the circular base is: $\pi(10)^2$

The circumference of the base is: $2\pi(10)$

The height is: 12

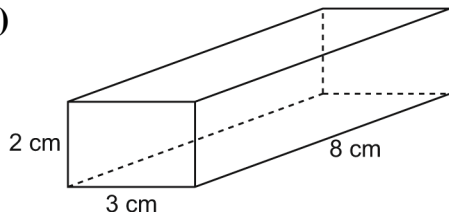
The surface area is: $2 \times \pi(10)^2 + 2 \times \pi(10) \times 12 \doteq 1382.30$

The surface area of the cylinder is approximately 1382.3 m^2 .

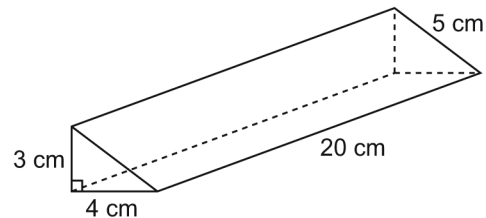
Check

1. Calculate the surface area of each object.

a)



b)



2. A cylinder has base radius 12 cm and height 15 cm. Determine the surface area of the cylinder to the nearest tenth of a square metre.