

Master 1.14a

Unit Test: Unit 6
Square Roots and Surface Area

Note: Unless otherwise stated, give all measurements to the nearest tenth of a unit.

1. a) Give an example of two rational numbers (one fraction and one decimal) that are perfect squares. Write their square roots.

- b) Give an example of two rational numbers (one decimal and one fraction) that are not perfect squares. Explain how you know they are not perfect squares.

- i) Use benchmarks to approximate the square root of each number.
Write the answer to the nearest tenth.

- ii) Use a calculator to approximate the square root of each number.
Write the answers to the nearest hundredth.

2. Which numbers below are perfect squares and have square roots between 3 and 4?
Explain how you know.

a) 10.24

b) $\frac{49}{4}$

c) 12.25

d) $\frac{221}{16}$

Master 1.14b

Unit Test continued

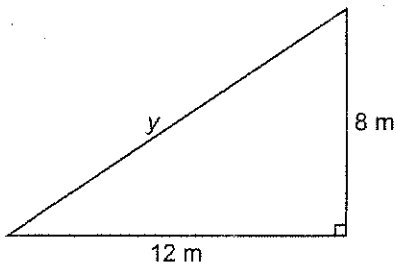
3. Find a fraction and a decimal between 0.5 and 0.7 that are perfect squares. Explain how you found them.

4. a) Use benchmarks to estimate $\sqrt{55}$ to the nearest tenth. Explain how you know.

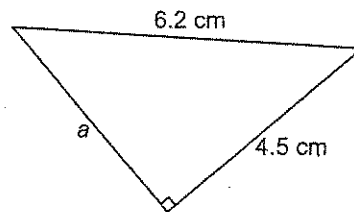
b) Use a calculator to estimate $\sqrt{55}$ to the nearest hundredth.

5. Calculate the length of the indicated side in each triangle.

a)

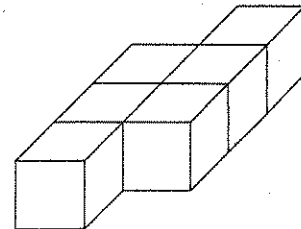


b)



6. The object at the right is constructed using linking cubes. Each face of a cube has an area of 1 unit².

a) Describe or show on the diagram where there are overlapping faces.

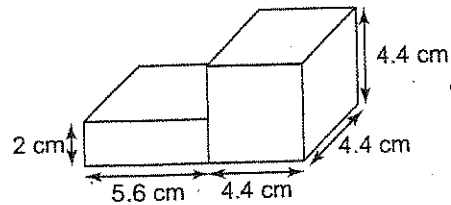


b) Determine the surface area of the composite object.

Master 1.14c

Unit Test continued

7. Determine the surface area of the composite object at the right.



8. Use the diagram on the right. The triangular prisms are congruent. Here is a student's work to determine the surface area of the composite object. Describe any errors and show a correct solution.

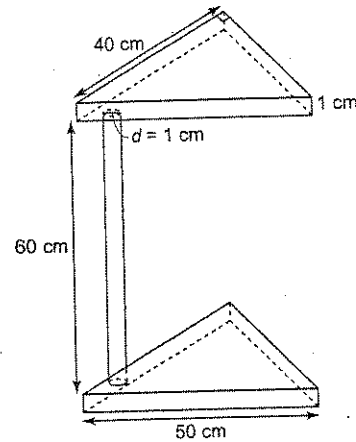
Triangular Prisms:

$$(4)\left(\frac{1}{2}\right)(40)(30) + 50(1)(2) \\ + 30(1)(2) + 40(1)(2) = 2640$$

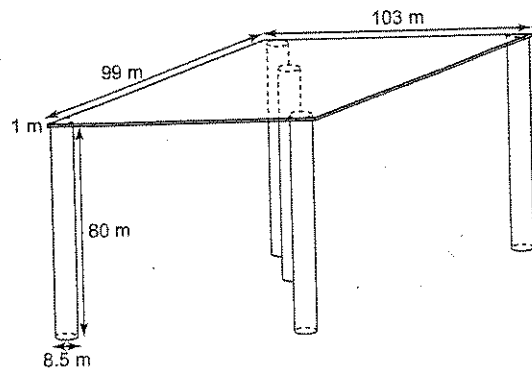
Cylinder:

$$\pi(1)(60) = 188.5$$

Total surface area: 2828.5 cm^2



9. The diagram at the right shows part of a platform for off-shore drilling. All the exposed surfaces (top and bottom) are to be prepared for use. Determine the surface area of the platform.



Master 1.15

Unit 1 Test Sample Answers

Unit 1 Test – Master 1.14

1. a) Answers will vary. For example: $\sqrt{\frac{4}{9}} = \frac{2}{3}$
and $\sqrt{0.04} = 0.2$
- b) Answers will vary. For example: $\sqrt{\frac{15}{9}}$,
15 is not a perfect square; $\sqrt{0.9} = \sqrt{\frac{9}{10}}$,
10 is not a perfect square.
- i) Answers will vary. For example:
 $\sqrt{\frac{15}{9}} \approx \sqrt{\frac{16}{9}} = \frac{4}{3}$
 $\sqrt{0.9}$: the benchmarks are 0.81 (0.9^2)
and 1.0 (1.0^2) which have square roots of
0.9 and 1.0, so an estimate is 0.95.
- ii) $\sqrt{\frac{15}{9}} \approx 1.3$ and $\sqrt{0.9} \approx 0.95$
2. $3^2 = 9$ and $4^2 = 16$
- a) 10.24 is between 9 and 16, and it is a
perfect square because its square root is
3.2.
- b) $\frac{49}{4}$ is between 9 and 16, and it is a
perfect square because its square root is
 $\frac{7}{2}$.
- c) 12.25 is between 9 and 16, and it is a
perfect square because its square root is
3.5.
- d) $\frac{221}{16}$ is not a perfect square; its square
root is between 3 and 4.
3. Answers will vary. For example,
 $\sqrt{0.5} \approx 0.707$ and $\sqrt{0.7} \approx 0.837$; so, use
0.75 and $\frac{8}{10}$ as square roots and their
squares are 0.5625 and $\frac{64}{100}$.
4. a) Benchmarks for $\sqrt{55}$: $\sqrt{49} = 7$ and
 $\sqrt{64} = 8$. $\sqrt{55}$ is a little closer to 7, so
estimate $\sqrt{55}$ as 7.4.
b) 7.42
5. a) About 14.4 m
b) About 4.3 cm
6. a) *Students should highlight the edges
where the faces overlap.*
b) 24 units²
7. About 187.8 cm²
8. The student forgot to account for the overlap;
the area should be 2826.9 cm².
9. About 31 479.4 m²