Date: _____

3.4 Using Exponents to Solve Problems

***MathLinks 9*, pages 114–119**

Key Ideas Review

Decide whether each of the following statements is true or false. Circle the word True or False. If the statement is false, rewrite it to make it true.

1. **True/False** A power in a formula represents a measurement.

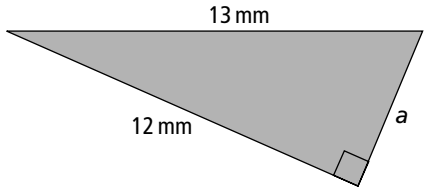
2. **True/False** Powers are often used to keep formulas as short as possible.

3. **True/False** Patterns involving repeated multiplication can be modelled by an expression that contains only coefficients.

Check Your Understanding

4. What is the surface area of a cube with an edge length of 12 cm? Write an exponential expression to solve the problem.

5. What is the length of the missing leg of the right triangle? Write an exponential expression to solve the problem.



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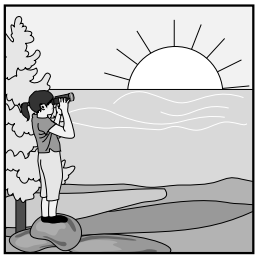
6. Right now there are 100 bacteria in sample P. This population doubles every hour. How many bacteria will there be after each number of hours?

a) n

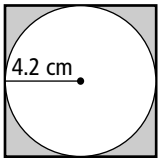
b) 5

c) 10

7. Due to Earth's curvature, objects, like the setting sun, seem to disappear over the horizon. The taller you are, the farther away the horizon appears to be. The formula $h = \frac{d^2}{12.8}$ is used to determine distance, d, in kilometres, to the horizon based on a person's height, h, in metres, above the ground. How tall is someone to whom the horizon appears to be 5.06 km away? Express your answer to the nearest metre.

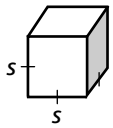


8. Write an exponential expression to determine the shaded area inside the square. Then, solve. Express your answer to the nearest tenth.

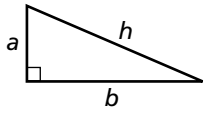


9. Simplify each formula using exponential notation.

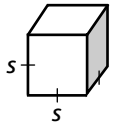
a) Surface area of a cube: $6 \times s \times s$



b) Pythagorean theorem: $h \times h = a \times a + b \times b$



c) Volume of a cube: $s \times s \times s$



10. Use your answers to #9 to complete the table.

Power(s)	Base(s)	Exponent(s)	Coefficient
a)			
b)			
c)			

11. A large playground cube has sides 1.5 m long.

a) Calculate the volume of the cube to the nearest hundredth.

b) Calculate the surface area of the cube that would have to be painted if one end is open and both the inside and outside are painted. Express your answer to the nearest tenth.