

Chapter 3 – Powers and Exponents

LESSON 6: SOLVING PROBLEMS WITH EXPONENTS (PART 1)

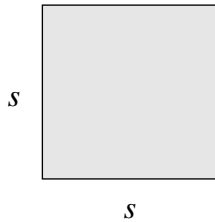
Using Known Formulas to Solve Problems

Powers are found in many formulas. When repeated multiplication is present in a formula, it is represented as a power. The use of powers keeps the formula as short as possible.

Many patterns that involve repeated multiplication can be modelled with expressions that contain powers. Here are a couple of known objects and formulas.

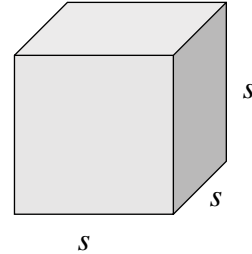
Area of a Square

$$A = s^2$$



Volume of a Cube

$$V = s^3$$



Surface Area of a Cube

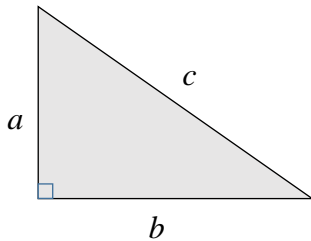
$$SA = 6s^2$$

(Think: Area of a square times 6 sides)

Pythagorean Theorem – for right triangles only

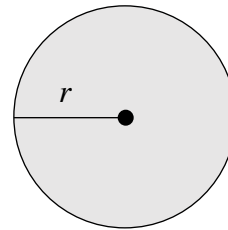
$$a^2 + b^2 = c^2,$$

(a and b = legs of the triangle, c = hypotenuse)



Area of a Circle

$$A = \pi r^2$$

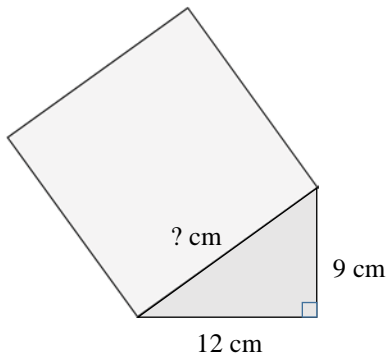


For all questions:

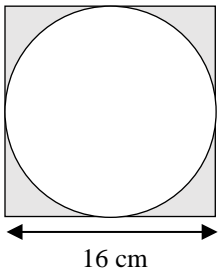
- Draw and label a diagram if none is provided.
- Write the formula you will use
- Substitute the known values in the formula and solve showing all steps
- Write a sentence answering the question and include units.

Ex.1: What is the surface area of a cube with an edge length of 3 m?

Ex.2: Find the side length of the square attached to the hypotenuse in the diagram.



Ex.3: The diagram shows a circle inscribed in a square with a side length of 16 cm. What is the area of the shaded region? Give your answer to one decimal place.



Ex.4: In the formula, $d = 4.9t^2$, d is the total distance, in metres, and t is the time, in seconds, that the skydiver free falls. Calculate the distance the skydiver falls in the following times.

a) 2 s

b) 4 s