Problem 1 – Edge length of a square

Examine the following question: What is the edge length of a square with an area of 45 cm^2?

Use the formula for the area *A* of a square with side length *s*.

$$A = s^2$$

- Solve this formula for *s*.

Use the graphs on page 1.8 to make sure that your equation makes sense. Use the **Length** and **Area** tools to find *s* and *A*. Then, using *x* for *A*, graph your equation in **f1**. Use the **Graph Trace** feature to place a point on the curve in the right pane. Drag the white point in the left pane to make the square that corresponds to the point.

Try a few points. Does your formula work?

- Rewrite your equation with fractional exponents. Enter this formula in **f2**.

- Evaluate your formula for *A* = 45. What is the edge length of the square?

Problem 2 – Edge length of a cube

Examine the following question: What is the edge length of a cube with a volume of 356 cm^3?

Use the formula for the volume *V* of a square with side length *s*.

$$V = s^3$$

- Solve this formula for *s*.

Examine the model on page 2.3. Graph your function in **f1**. How does your formula compare to the calculated volume and side lengths?

- Rewrite your equation with fractional exponents. Enter this formula in **f2**.

- Evaluate your formula for *V* = 356. What is the edge length of the cube?

Problem 3 – Edge length of an octahedron

A scientist has a piece of radioactive uraninite shaped like an octahedron. Weighing it, she finds its volume is 1,512 mm^3. What is the approximate edge length of the piece?

Use the formula for the volume V of an octahedron with side length s.

$$V = \frac{\sqrt{2}}{3}s^3$$

- Solve this formula for s.

- Check your formula by substituting $\frac{\sqrt{2}}{3}s^3$ for V in to your formula and simplify.

- Evaluate your formula for $V = 1{,}512$. What is the edge length of the octahedron?