MATHEMATICS PARENT GUIDE

GEOMETRY

THE FOLLOWING ARE SPECIFIC SKILLS STUDENTS NEED TO ACQUIRE IN GEOMETRY:

GEOMETRY

▶ Students in Geometry understand logical reasoning. They analyze relationships in lines, triangles, quadrilaterals, polygons, and circles. They construct geometric figures and analyze three-dimensional figures.

Examples: Prove the Pythagorean Theorem.
Construct a square.

ALGEBRA

▶ Students use algebra and the coordinate plane to explore geometry. They find equations for geometric figures such as parallel lines and circles.

Examples: Find a line perpendicular to $y = -\dfrac{4}{3}x - 1$.
Write the equation of a circle with radius 6, centered at (2, 5).

TRIGONOMETRY

▶ Students understand right triangle trigonometry and use relationships to solve for missing sides and angles of right triangles.

Examples: In a 45-45-90 right triangle, if one leg measures 6 inches, what are the measures of the other two sides?
Find sin 60°.

MEASUREMENT

▶ Students find and use formulas for perimeter, area, surface area and volume for a variety of figures. They solve problems using geometric reasoning.

Examples: Find the distance between (–3, 7) and (4, 2).

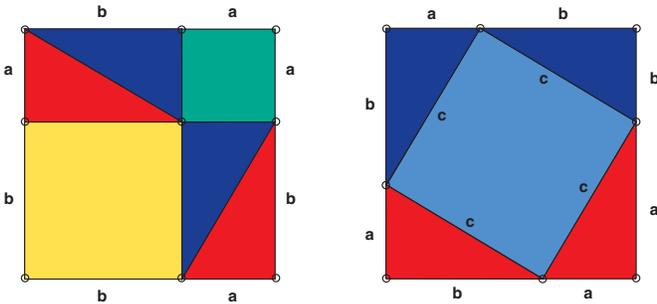Find the volume of a cone with a radius of 6 inches and a height of 8 inches.

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MATH

PARENT GUIDE

Geometry

Prove the Pythagorean Theorem (one possibility):

$$2ab + a2 + b2 = 4(\frac{1}{2}ab) + c2$$

$$2ab + a2 + b2 = 2ab + c2$$

$$a2 + b2 = c2$$

Construct a square:

This can be done with:

- ▶ A compass and straight edge.
- ▶ Mira.
- ▶ Geometry technology such as the Geometer's *Sketchpad*.
- ▶ Patty Paper.

Algebra

Find a line perpendicular to $y = -\frac{4}{3}x - 1$.

$$m = \frac{-4}{3}$$

Any line with a slope of $\frac{3}{4}$ will do, such as:

$$y = \frac{3}{4}x + 2 \quad \textbf{\textit{or}} \quad 3x - 4y = 4$$

Write the equation of a circle with a radius of 6, centered at (2, 5).

$$(x - h)^2 + (y - k)^2 = r^2$$

$$(x - 2)^2 + (y - 5)^2 = 36$$

Trigonometry

In a 45-45-90 right triangle, if one leg measures 6 inches, what are the measures of the other two sides?

The other leg measures 6 inches.

The hypotenuse measures $6\sqrt{2}$ inches.

Find sin 60°

Using the unit circle: $\frac{\sqrt{3}}{2}$

Using a calculator: .866025

Measurement

Find the distance between (–3, 7) and (4, 2).

$$(2 - 7)^2 + [4 - (-3)]^2 = \sqrt{74} \approx 8.6$$

Find the volume of a cone with a radius of 6 inches and a height of 8 inches.

$$V = \frac{1}{3}\pi r^2 h$$

$$V = \frac{1}{3}\pi(6)^2(8) = 96\pi \text{ in}^3$$