Bellwork
12/05/2011

1. Simplify $\sqrt{48}$ in simplest radical form.

$\sqrt{16}\cdot\sqrt{3}$

$4\sqrt{3}$

Example: $\sqrt{8}=2\sqrt{2}$

$\sqrt{8}$

$\sqrt{4}\cdot\sqrt{2}$

$2\sqrt{2}$

2. Factor $3x^2+2x-1$.

$(3x-1)(x+1)$

$-x+3x=2x\sqrt{}$

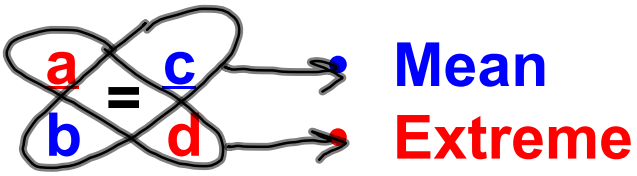
Geometry
6.1 Ratios, Proportions, and the Geometric Mean
Standard(s): 4,9

Vocabulary:

1. **Ratio of *a* to *b*: If *a* and *b* are two numbers or quantities and *b*≠0, then the ratio is $\frac{a}{b}$.** $a:b$ a to b $\frac{a}{b}$

2. **Proportion: An equation that states that two ratios are equal.**

3. **Extremes:**



4. **Means:**

5. **Geometric Mean: The square root of the product of the two numbers.**

KEY CONCEPT *For Your Notebook*

Geometric Mean

The **geometric mean** of two positive numbers a and b is the positive number x that satisfies $\frac{a}{x} = \frac{x}{b}$. So, $x^2 = ab$ and $x = \sqrt{ab}$.

Geometric Mean: Multiply the numbers and take the square root.

KEY CONCEPT *For Your Notebook*

A Property of Proportions

1. **Cross Products Property** In a proportion, the product of the extremes equals the product of the means.

If $\frac{a}{b} = \frac{c}{d}$ where $b \neq 0$ and $d \neq 0$, then $ad = bc$.

$\frac{2}{3} = \frac{4}{6}$ $3 \cdot 4 = 12$, $2 \cdot 6 = 12$

Solve Proportions: Multiply using cross products!

Simplify Ratios

Simplify the ratio.

NOTE: Find the GCF!

A. 12km:3km

$\frac{12\text{ km}}{3\text{ km}}$

4 km : 1 km

B. $\frac{\textbf{10 in.}}{\textbf{2 ft.}}$

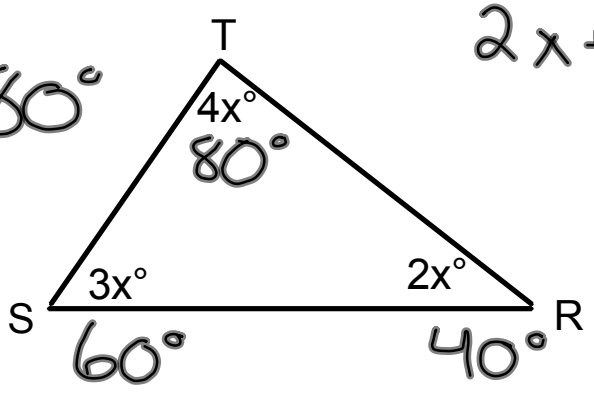
$\frac{10\text{ in}}{24\text{ in}}$

5 in : 12 in

Use Extended Ratios

The measure of the angles of ΔRST are in the extended ratio 2:3:4. Find the measures of the angles.

40°, 60°, 80°



$2x+3x+4x=180$

$9x=180$

$x=20$

Attach a variable to the ratios!

Solve Proportions

Solve the proportion.

A. $\frac{2}{x+3} = \frac{5}{4x}$

$8x = 5x + 15$

$3x = 15$

$x = 5$

B. $\frac{6}{x+4} = \frac{x-4}{x}$

$(x+4)(x-4) = 6x$

$x^2 - 4x + 4x - 16 = 6x$

$x^2 - 16 = 6x$

$-6x$

$x^2 - 6x - 16 = 0$

$(x+2)(x-8) = 0$

$x+2=0 \quad x-8=0$

$x = -2, 8$

Use a Ratio to Find a Dimension and Variables

The area of the rectangle is 108 ft^2, and the ratio of the length to the width is 4:3. Find the length and width of fence needed to enclose the garden.

$l : w$

$4 : 3$

$A = 108 \text{ ft}^2$

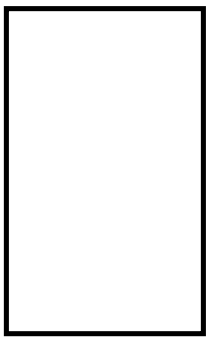
$A = l \cdot w$

$108 = 4x \cdot 3x$

$12x^2 = 108$

$\sqrt{x^2} = \sqrt{9}$

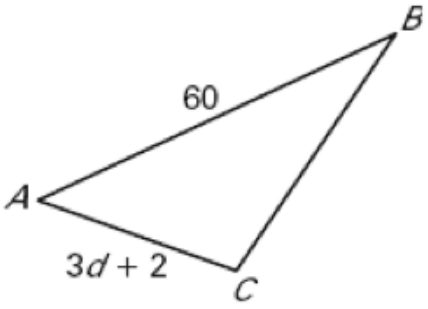
$x = 3$



The ratio of two side lengths for the triangle is given. Solve for the variable.

$AB : AC$ is $15 : 8$

$\frac{AB}{AC} = \frac{15}{8}$



$\frac{60}{3d+2} = \frac{15}{8}$

$45d + 30 = 480$

$45d = 450$

$d = 10$

Find a Geometric Mean

Find the geometric mean of the two numbers. Write the answer in simplest radical form (no decimals).

NOTE: Multiply the numbers, then take the square root!

A. 18 and 54

$\sqrt{972}$

$\sqrt{324} \cdot \sqrt{3}$

$18\sqrt{3}$

B. 16 and 18

$\sqrt{288}$

$\sqrt{144} \cdot \sqrt{2}$

$12\sqrt{2}$

Homework Assignment

Worksheet 6.1C