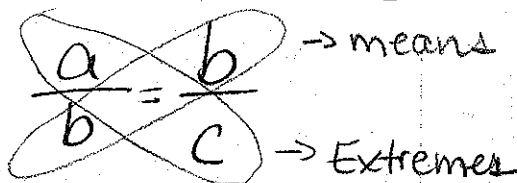


January 24, 2014

8.1 Warm-Up

1. What do you know about geometric means and extremes?



8.1 Geometric Mean

Target: Use proportions to find geometric means

Geometric Mean

1. Set up proportion $\frac{\text{---}}{\text{---}} = \frac{\text{---}}{\text{---}}$

2. Put in two X's for means

3. Add numbers and solve

$$\frac{x}{x} = \frac{x}{x}$$

$$\frac{4}{x} = \frac{x}{9}$$

$$36 = x^2$$
$$x = 6$$

Find the geometric mean between each pair of numbers.

1. 5 and 20

$$\frac{5}{x} = \frac{x}{20}$$

$$100 = \sqrt{x^2}$$

$$x = 10$$

2. 36 and 4

$$\frac{36}{x} = \frac{x}{4}$$

$$144 = \sqrt{x^2}$$

$$x = 12$$

3. 40 and 15

$$\frac{40}{x} = \frac{x}{15}$$

$$600 = \sqrt{x^2}$$

$$x = 24.5$$

Find the geometric mean between each pair of numbers.

4. 81 and 4

$$\frac{81}{x} = \frac{x}{4}$$

$$324 = \sqrt{x^2}$$

$$x = 18$$

5. 25 and 16

$$\frac{25}{x} = \frac{x}{16}$$

$$400 = \sqrt{x^2}$$

$$x = 20$$

6. 20 and 25

$$\frac{20}{x} = \frac{x}{25}$$

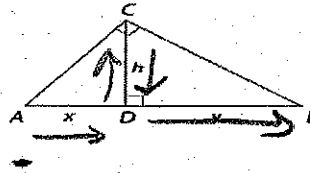
$$500 = \sqrt{x^2}$$

$$x = 22.4$$

Theorems Right Triangle Geometric Mean Theorems

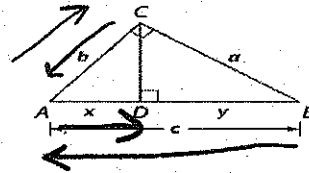
8.2 Geometric Mean (Altitude) Theorem The altitude drawn to the hypotenuse of a right triangle separates the hypotenuse into two segments. The length of this altitude is the geometric mean between the lengths of these two segments.

Example $\frac{x}{h} = \frac{h}{y}$



8.3 Geometric Mean (Leg) Theorem The altitude drawn to the hypotenuse of a right triangle separates the hypotenuse into two segments. The length of a leg of this triangle is the geometric mean between the length of the hypotenuse and the segment of the hypotenuse adjacent to that leg.

Example $\frac{c}{b} = \frac{b}{x}$



Find x , y , and z .

7. $\frac{3}{x} = \frac{x}{12}$
 $x^2 = 36$
 $x = 6$

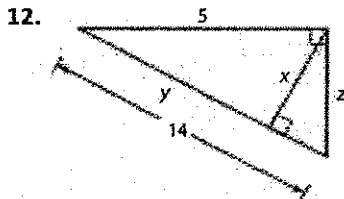
8. $\frac{8}{16} = \frac{16}{x}$

Find x , y , and z .

9. $\frac{4}{x} = \frac{x}{9}$
 $x^2 = 36$
 $x = 6$

10. $\frac{6}{17} = \frac{17}{y-6}$
 $289 = 6(y-6)$
 $289 = 6y - 36$
 $+36$
 $325 = 6y$
 $y = 54.1\bar{6}$

11. $\frac{4}{y} = \frac{y}{z}$
 $y = 4.9$



13. $\frac{10}{20} = \frac{20}{x}$
 $400 = 10x$
 $x = 40$

