

1. a ratio is a fraction that compares numbers with the same unit of measure.
2. proportion is two equal ratios
3. cross product is the step we take to solve a proportion - the result of the cross product is another equation that can be solved (often times easier)

$$\frac{x}{3} = \frac{2}{6} \rightarrow \text{cross product}$$

$$\frac{x}{3} = \frac{2}{6}$$

$$6x = 6$$

$$x = 1$$

4. True; property of proportions

5. true; cross product  $\frac{5x}{z} = \frac{e}{f}$

$$5xf = ez$$

6. True; property of proportions

7.  $\frac{z^4}{2x}$

$$\frac{4x^2z^5}{8x^3z} = \frac{4 \cdot x \cdot x \cdot z \cdot z \cdot z \cdot z \cdot z}{4 \cdot 2 \cdot x \cdot x \cdot x \cdot z}$$
$$= \frac{z^4}{2x}$$

8.  $x=10$

$$\frac{3x}{10} = \frac{12}{4}$$

$$4(3x) = 12(10) \text{ cross prod.}$$

$$12x = 120$$

$$x = 10$$

9.  $x = \frac{3}{7}$

$$\frac{5}{7} = \frac{x+1}{2}$$

$$10 = 7(x+1) \quad \text{cross prod.}$$

$$10 = 7x + 7$$

$$3 = 7x$$

$$x = \frac{3}{7}$$

10.  $x = 20$

$$\frac{x}{x+5} = \frac{x-4}{x}$$

cross prod.  $x^2 = (x-4)(x+5)$

$$x^2 = x^2 + 5x - 4x - 20$$

$$0 = 1x - 20$$

$$20 = x$$

11. congruent polygons have the same size and shape; similar polygons only have the same shape.

12.  $\triangle ABC \sim \triangle EFG$

13. proportion

14.  $x=8$

compare respective sides to form a proportion

$$\frac{12}{x} = \frac{6}{4}$$

$$48 = 6x$$

$$x = 8$$

$$\frac{12}{z} = \frac{6}{y} \quad \text{or} \quad \frac{8}{z} = \frac{4}{y}$$



not enough information to solve for  $y, z$ .

15.  $y=5$   
 $x=15$   
 $z=1.3$

compare respective sides to form a proportion

$$\frac{3}{y} = \frac{9}{15}$$

$$45 = 9y$$

$$y = 5$$

$$\frac{3}{5} = \frac{9}{x}$$

$$3x = 45$$

$$x = 15$$

$$\frac{5}{z} = \frac{15}{4}$$

$$20 = 15z$$

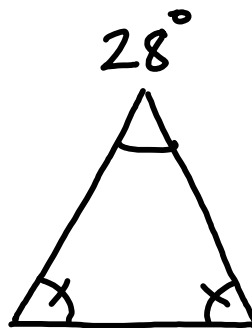
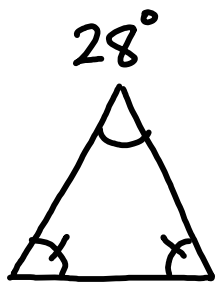
$$z = 1.3$$

16. Yes, see theorem:

*If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar*

17. They are similar - AA Post.

Note: the triangles are isosceles (so base angles are congruent) the triangles have equal angle measures. If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar



18.  $x = 22.5$

$$\frac{12}{15} = \frac{18}{x}$$

$$12x = 270$$

$$x = 22.5$$

19.  $x = 6$

$$\frac{14-x}{x} = \frac{12}{9}$$

$$9(14-x) = 12x$$

$$126 - 9x = 12x$$

$$126 = 21x$$

$$x = 6$$

20.  $x=4$

$$\frac{8x}{6x} = \frac{10x}{30}$$

$$\frac{8}{6} = \frac{10x}{30} \quad \left. \vphantom{\frac{8}{6}} \right\} \begin{array}{l} \text{reduce} \\ \text{fractions} \end{array}$$

$$\frac{4}{3} = \frac{x}{3}$$

$$3x = 12$$

$$x = 4$$