

Similarities

Homework Practice Test 7

Name _____

Answer true or false. If false, tell why in the margin after the problem.

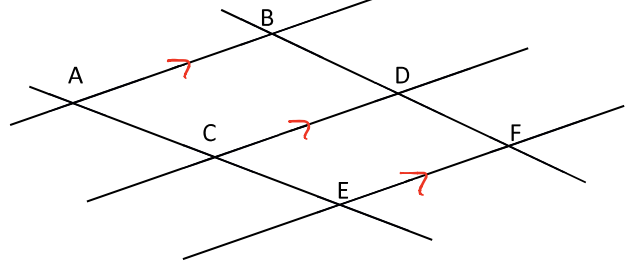
- #1) A ratio is a comparison of two numbers. *True*
- #2) Cross products are another name for cross multiply. *True*
- #3) The golden ratio was used by Egyptians and is the ratio 1:1.618. *True*
- #4) If two angles of one triangle are congruent to two angles of another triangle, then the triangles are congruent. *False Similar*
- #5) Similarity of triangles is reflexive, symmetric, and transitive. *True*
- #6) An altitude of a triangle goes through a vertex and is perpendicular to the side opposite that vertex. *True*
- #7) Perimeter is the distance around an object. *True*
- #8) A proportion is an equation stating that two ratios are equal. *True*
- #9) If triangle ABC is similar to triangle EFG, then $\frac{AB}{EF} = \frac{BC}{EG}$. *False FG*
- #10) An equilateral triangle always has 60° angles. *True*

Multiple choice. Choose the best answer.

#11) Which of the following proportions is true if quadrilateral ABCD is similar to quadrilateral EFGH?

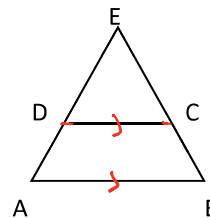
- A) $\frac{AB}{DC} = \frac{HG}{EF}$ *False*
- B) $\frac{AD}{DC} = \frac{HE}{FG}$ *False*
- C) $\frac{BC}{DC} = \frac{FG}{HG}$ *True*
- D) $\frac{17}{19} = \frac{3}{4}$ *?*

#12) Which of the following is **NOT true** given that $\overline{AB} \parallel \overline{CD} \parallel \overline{EF}$?



- A) $\frac{AC}{BD} = \frac{CE}{DF}$ *True*
- B) $\frac{AE}{BF} = \frac{CE}{DF}$ *True*
- C) $\frac{AC}{BD} = \frac{DF}{CE}$ *False*
- D) $\overline{AB} \parallel \overline{EF}$

#13) Which of the following is a true conclusion given that $\overline{AB} \parallel \overline{DC}$?



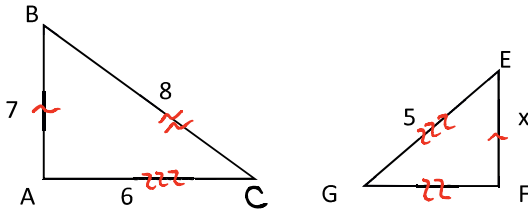
- A) $2DC = AB$
- B) $DC = \frac{1}{2}AB$
- C) $\frac{DC}{AB} = \frac{AB}{DC}$ *False*
- D) $\frac{ED}{EC} = \frac{DA}{CB}$ *✓*
- Handwritten note: } only true if DC is a midsegment*

Similarities

Homework Practice Test 7

Name _____

#14) If $\triangle ABC$ is similar to $\triangle EFG$, find x .



A) $\frac{35}{6}$

B) $\frac{40}{7}$

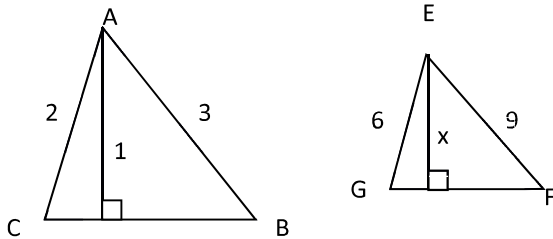
C) $\frac{35}{8}$

D) No solution.

$$5 \cdot \frac{7}{6} = \frac{x}{5} \cdot 5$$

$$\frac{35}{6} = x$$

#15) If triangle ABC is similar to triangle EFG, find x .



A) $\frac{1}{3}$

B) 3

C) $\frac{9}{2}$

D) $\frac{2}{9}$

$$\frac{x}{1} = \frac{6}{2}$$

$$x = 3$$

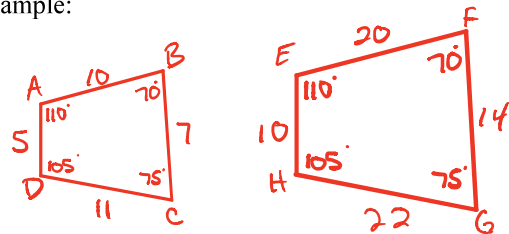
Short answer. Use complete sentences. A definition covers all situations. An example is a specific situation.

#16) Define similar polygons. Also, give an example of similar polygons.

Definition

Two polygons are similar if corresponding angles are congruent and corresponding sides are proportional.

Example:



$$ABCD \sim EFGH$$

#17) Define congruent polygons. Also, give an example of congruent polygons.

Definition

Two polygons are congruent if corresponding angles and sides are congruent.

Example:



$$ABCD \cong EFGH$$

Similarities

Homework Practice Test 7

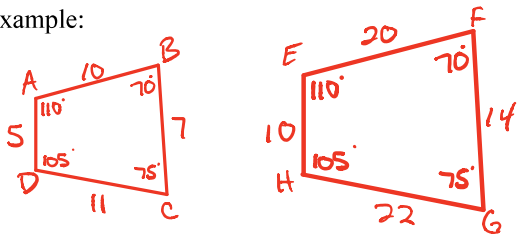
Name _____

#18) Define scale factor. Also, give an example of a scale factor.

Definition

The ratio of the lengths two corresponding sides of two similar polygons.

Example:



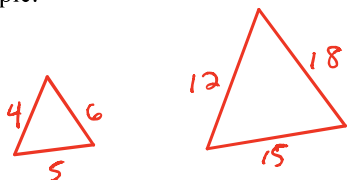
$$\text{Scale factor of } \frac{ABCD}{EFGH} = \frac{10}{20} = \frac{1}{2}$$

#19) Define SSS similarity. Also, give an example of SSS similarity.

Definition

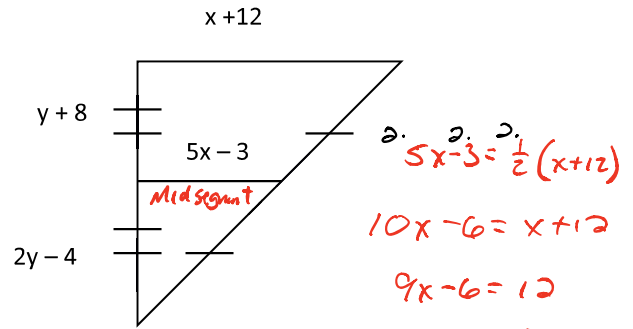
If the measures of the corresponding sides of two triangles are proportional, then the triangles are similar.

Example:



$$\frac{4}{12} = \frac{5}{15} = \frac{6}{18} = \left(\frac{1}{3}\right)$$

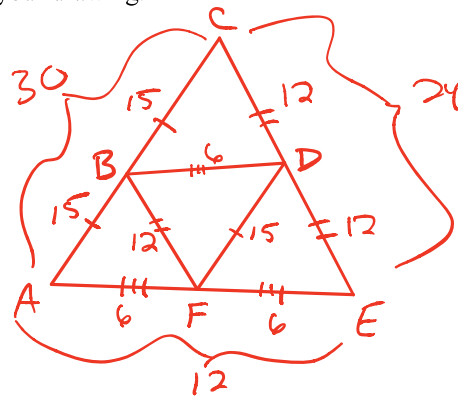
#20) Find the value of x and y.



$$\begin{aligned} 5x-3 &= \frac{1}{2}(x+12) \\ 10x-6 &= x+12 \\ 9x-6 &= 12 \\ 9x &= 18 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} y+8 &= 2y-4 \\ 8 &= y-4 \\ 12 &= y \end{aligned}$$

#21) If B, D, and F are midpoints of sides \overline{CA} , \overline{CE} , and \overline{AE} respectively, $BD = 6$, $BF = 12$, and $DF = 15$, find the perimeter of $\triangle AEC$. Also, label the lengths of each segment in your drawing.



$$P_{\triangle AEC} = 30 + 12 + 24$$

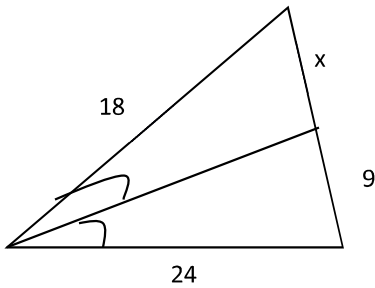
$$P_{\triangle AEC} = 66$$

Similarities

Homework Practice Test 7

Name _____

#22) Find the value of x.



$$\frac{x}{18} = \frac{9}{24}$$

$$\frac{x}{18} = \frac{3}{8}$$

$$x = \frac{3}{8}(18)$$

$$x = \frac{3}{4}(9)$$

$$x = \frac{27}{4}$$

#23) Find all values of x.

~~$$x \frac{x+1}{x} = \frac{8}{x}$$~~

$$x^2 + x = 56$$

$$x^2 + x - 56 = 0$$

$$(x + 8)(x - 7) = 0$$

$$x + 8 = 0 \quad \left. \begin{array}{l} \\ \end{array} \right\} x - 7 = 0$$

$$x = -8 \quad \left. \begin{array}{l} \\ \end{array} \right\} x = 7$$

#24) The pitch of a roof is the ratio of the rise to the run. If a roof has a rise of 2.5 feet and a run of 13.5 feet, what is its pitch?

$$\text{Pitch} = \frac{\text{rise}}{\text{run}}$$

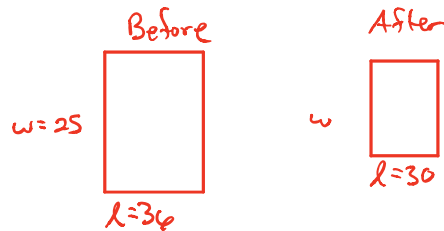
$$= \frac{2.5}{13.5} \frac{10}{10}$$

$$= \frac{25 \div 5}{135 \div 5}$$

$$\text{Pitch} = \frac{5}{27}$$

The pitch is $\frac{5}{27}$

#25) Joan Frank is a potter making a rectangular clay plaque 25 inches wide and 36 inches long. The plaque shrinks uniformly in the kiln to a 30 inch length. What is the width after the plaque shrinks?



$$\frac{25}{36} = \frac{w}{30}$$

$$\frac{30(25)}{36} = w$$

$$\frac{5(25)}{6} = w$$

$$\frac{125}{6} = w$$

$$20.83 \approx w$$

The width is about 20.83 inches.