- **Similar Figures** – Polygons that have the same **SHAPE**, but different **SIZE**

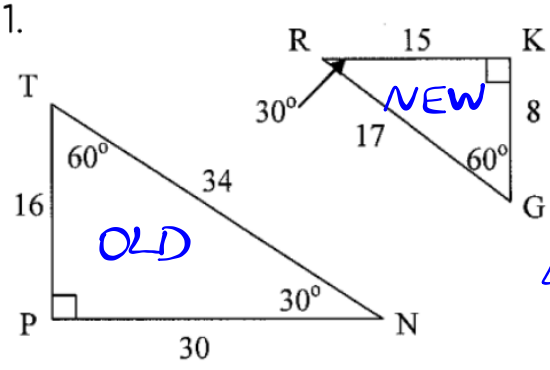
Two polygons are similar if and only if:

- ✓ **ALL** corresponding **angle measures** are **CONGRUENT**
- ✓ **ALL** corresponding **sides** are **PROPORTIONAL** using a **SCALE FACTOR**

When two polygons are similar, we can write a **similarity** statements using the symbol " ~ ".

Are these figures similar? If so, write a similarity statement.

1.



MATCH SIZES

Check angles:

$\angle T = 60° = \angle G$

$\angle P = 90° = \angle K$

$\angle N = 30° = \angle R$

✓

Check sides:

$\frac{8}{16}$ $\frac{15}{30}$ $\frac{17}{34}$

↓ ↓ ↓

0.5 0.5 0.5

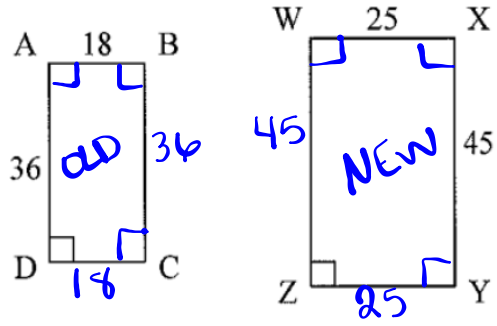
✓

$\triangle TPN \sim \triangle GKR$

Are these figures similar? If so, write a similarity statement.

□ABCD and □WXYZ are rectangles

2.



Check angles:

All right angles are congruent ✓

Check sides:

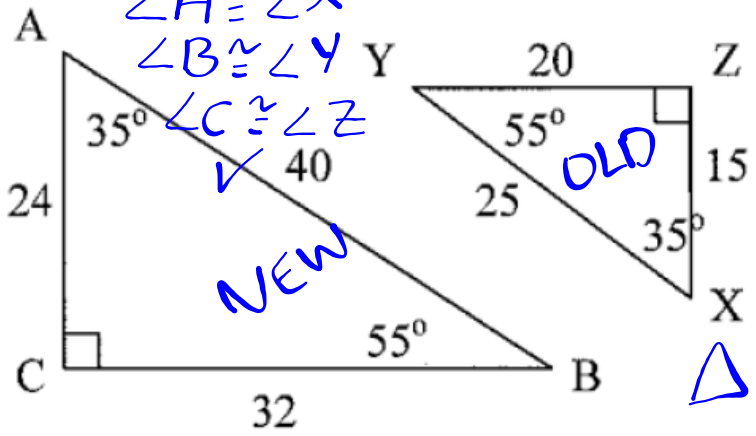
$\frac{25}{18}$ ↓ 1.38

$\frac{45}{36}$ ↓ 1.25

NO!

Are these figures similar? If so, write a similarity statement.

3.



Angles:

$\angle A \cong \angle X$

$\angle B \cong \angle Y$

$\angle C \cong \angle Z$ ✓

Sides

$\frac{24}{15}$ ↓ 1.6

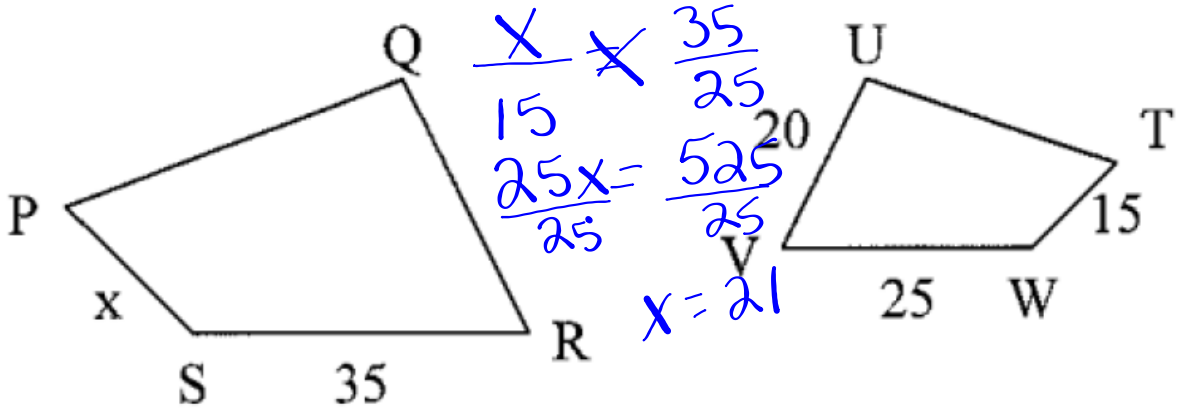
$\frac{32}{20}$ ↓ 1.6 ✓

$\frac{40}{25}$ ↓ 1.6

$\triangle ABC \sim \triangle XYZ$

4. Given $\square PQRS \sim \square TUVW$.

Write a proportion to find the length of $\overline{PS}$.



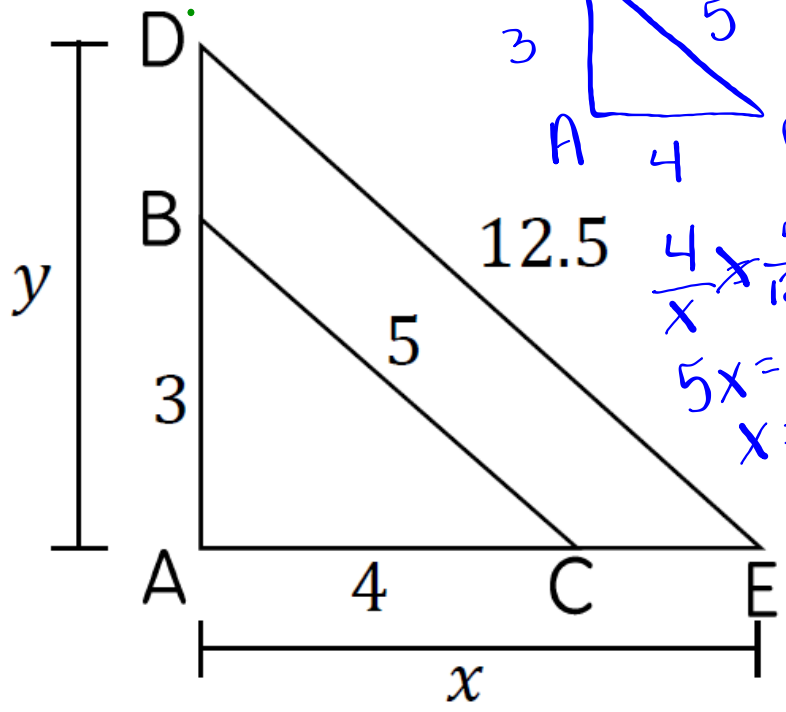
$\frac{x}{15} = \frac{35}{25}$

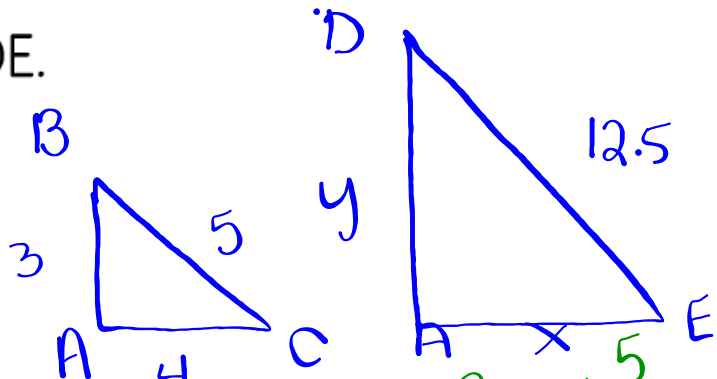
$\frac{25x}{25} = \frac{525}{25}$

$x = 21$

5. Given $\Delta ABC \sim \Delta ADE$.

Solve for x and y.





$\frac{4}{x} = \frac{5}{12.5}$

$5x = 50$

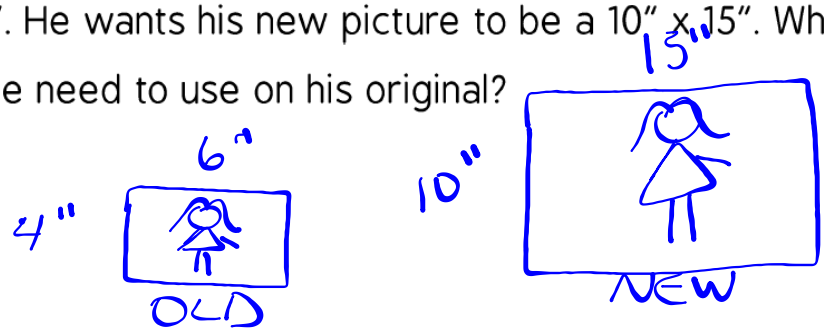
$x = 10$

$\frac{3}{y} = \frac{5}{12.5}$

$5y = 37.5$

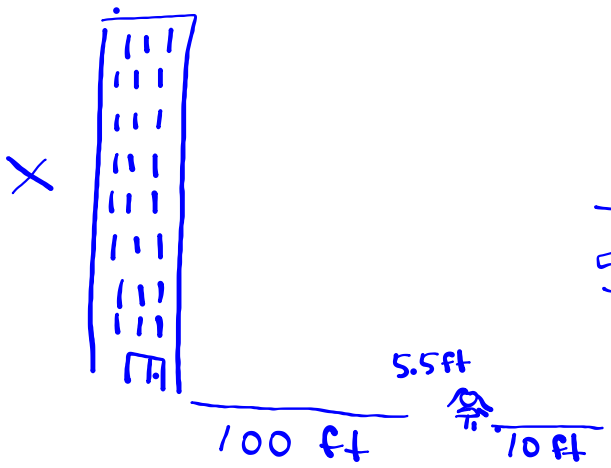
$y = 7.5$

6. Sam went to Walgreens to enlarge a picture. Currently, his picture is a 4" x 6". He wants his new picture to be a 10" x 15". What scale factor does he need to use on his original?



$\frac{10}{4} = 2.5$

7. Sally is standing next to a building and notices her shadow is 10 ft long. If the building's shadow is 100 ft long and she is 5.5 ft tall, how tall is the building?

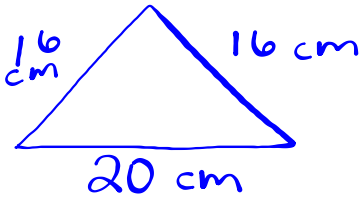


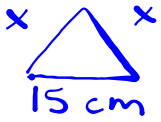
$\frac{X}{5.5} = \frac{100}{10}$

$10X = 550$

$X = 55$ ft.

8. Chris wants to reduce a triangular pattern for the quilt he is making. His current pattern sides are 16, 16, and 20 cm. If the longest side of the new pattern is to be 15 cm, how long should the other two sides be?



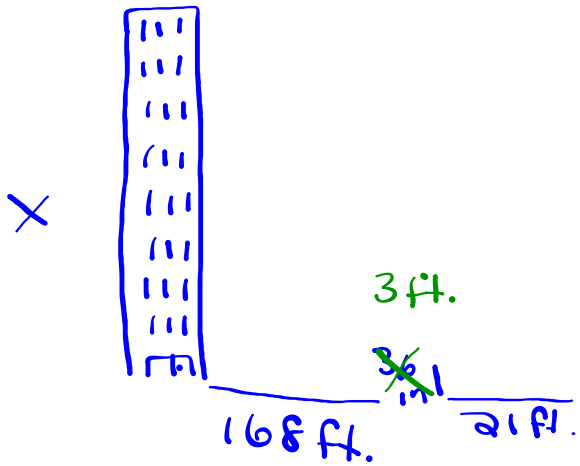


$\frac{x}{16} = \frac{15}{20}$

$20x = 240$

$x = 12$ cm

9. A 36-inch yardstick casts a 21-foot shadow, how tall is a building whose shadow is 168 feet?



$\frac{x}{3} = \frac{168}{21}$

$21x = 504$

$x = 24$ ft.

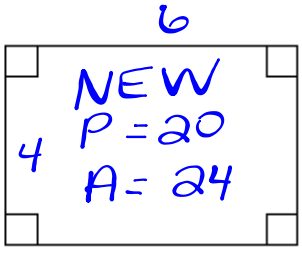
10. A model house has a scale of 1 in : 2 ft. If the real house is 26 ft. wide, then how wide is the model house?

$$\frac{1\text{ in}}{2\text{ ft}} = \frac{x}{26\text{ ft}}$$

$$26 = 2x$$

$$13 = x$$

13 in.

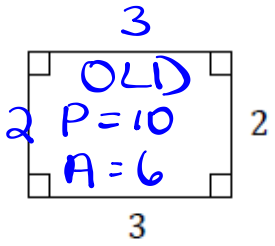


A. What is the **scale factor** from the small rectangle to the big rectangle?

$\frac{6}{3} = 2 \rightarrow$ scale factor

B. How did the **perimeter** change?

$\frac{20}{10} = 2$ perimeter = scale factor



C. How did the **area** change?

$\frac{24}{6} = 4$ area = scale factor^2