Name: _____   Date: _____

Unit 8 – Similarity

OBJECTIVES ~ SWBAT Find and simplify the ratio of two numbers
SWBAT Use proportions to solve problems

Ratio~

-
-
-
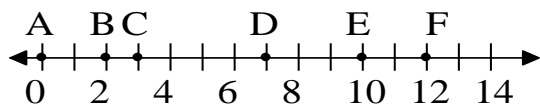
Examples

Simplify the following ratios.

1. $\dfrac{12}{15}$ **2.** $\dfrac{14}{56}$ **3.** $\dfrac{21}{6}$

4. Use the number line to find the ratio of the distances.

$$\dfrac{AB}{CD} =$$ $$\dfrac{BC}{DE} =$$ $$\dfrac{AC}{BD} =$$

HELPFUL KEY   1 mi = 1,609.344 meters

1 ft = 12 in.   3 ft = 1 yd   1m = 100 cm   1kg = 1000g   1 gal = 4 quarts   64ozs = 1 gal

1   mile = 5,280 ft.   1 lb = 16 oz.   1 km = 1000 m   4qt = 1 gal 1 pint = 2 cups

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5. Simplify the following Ratios

a. $\dfrac{24oz}{2lb}$ b. $\dfrac{14\,ft}{6\,yd}$ c. $\dfrac{4\,ft}{8in}$ d. $\dfrac{24days}{36hours}$

Cross Product Property ~

$$\frac{a}{b} = \frac{c}{d}$$

Examples:

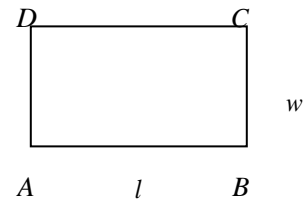Solve the proportions.

6. $\dfrac{4}{x} = \dfrac{5}{15}$

7. $\dfrac{4}{x} = \dfrac{5}{7}$

8. $\dfrac{3}{y+2} = \dfrac{2}{y}$

9. $\dfrac{3-x}{6} = \dfrac{x}{2}$

Solve the following Proportions:

10. The perimeter of rectangle ABCD is 60 centimeters. The ratio of AB:BC is 3:2. Find the length and width of the rectangle.

D _____ C

w

A l B

11. The ratio of the angles of a triangle are 10:5:3. What are the measures of each angle?

12. A triangle has a perimeter of 264 meters. If the ratio of each side is 4:7:11. What is the length of each side?

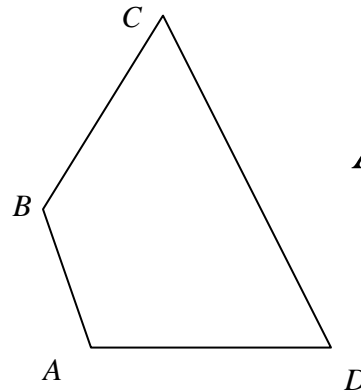**13.** When a 10 foot vertical pole casts a 2 foot shadow, and a pine tree has a 25-foot shadow. How tall is the tree?

Similar Figures:

Scale Factor:

ABCD ^ EFGH
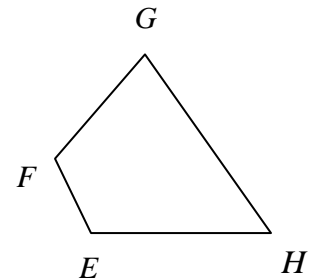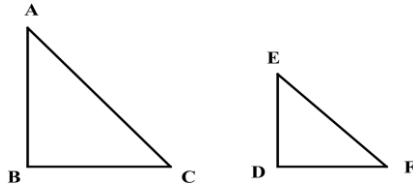
Identifying similar polygons

List all pairs of congruent angles, and then write a proportion that relates to the corresponding sides for each pair of similar polygons.

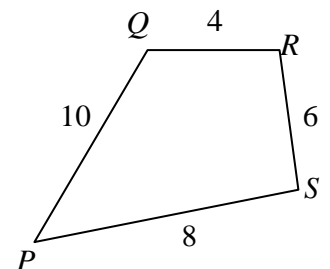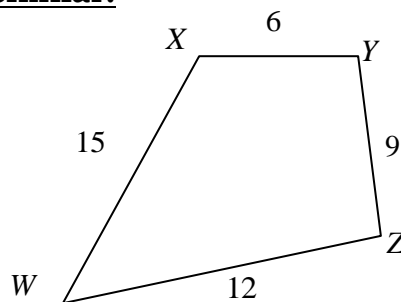**1.** Δ*ABC* ~ Δ*EDF*   **SIDES**   **ANGLES**

2. Decide if the following figures are similar.

## Given the two polygons are *SIMILAR*. Find the values of *x* and *y*.

3.

6
x
10
4

4.

16
12
x
18
12
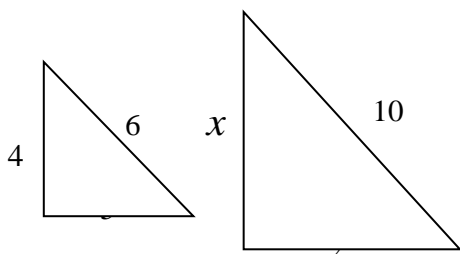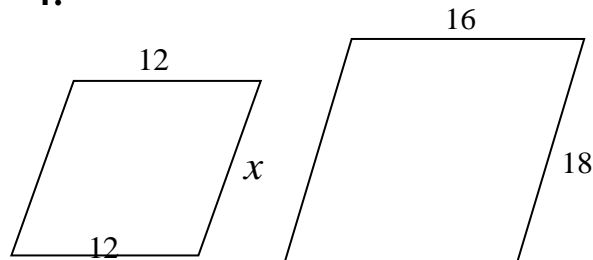
Similar Polygon and Perimeter Theorem:

If two polygons are similar, then their perimeters are proportional to the scale factor between them.

If $KLMN \sim PQRS$,

then $\dfrac{KL + LM + MN + NK}{PQ + QR + RS + SP} = \dfrac{KL}{PQ} = \dfrac{LM}{QR} = \dfrac{MN}{RS} = \dfrac{NK}{SP}$.
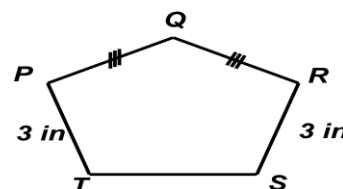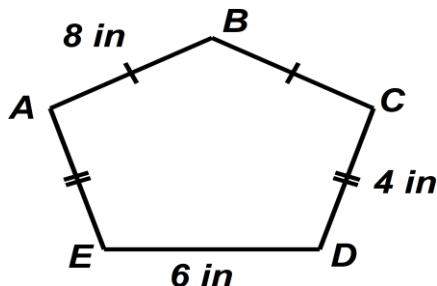
5. Given the following triangles, write all the ratios of sides and perimeters.

B
6
9
C
3
Y
2
Z
12
X
4
A
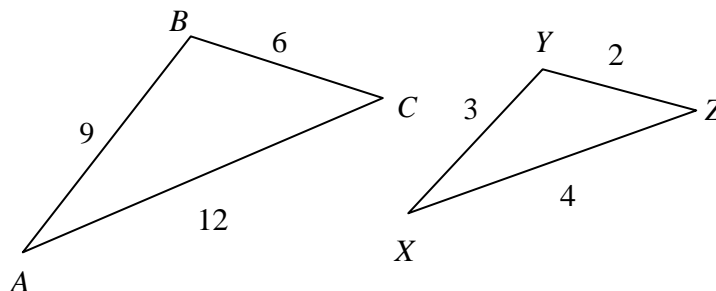
Scale Factor: _____

Perimeter Ratio: _____

6. If *ABCDE ~ PQRST* **, find the scale factor of ABCDE to PQRST, and each polygons perimeter.**

8 in
B
A
C
4 in
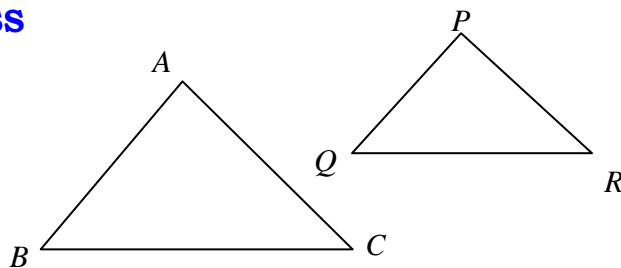E
6 in
D

P
Q
R
3 in
3 in
T
S

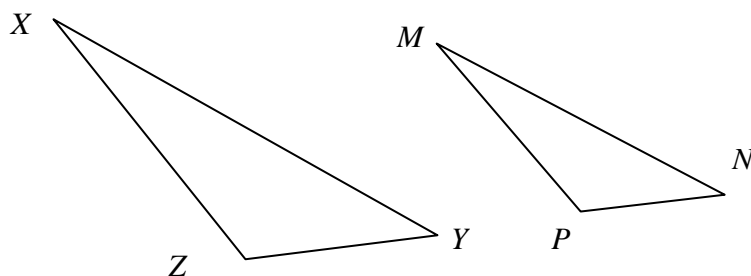Scale Factor: _____   Perimeter of ABCDE _____ PQRST _____

OBJECTIVES ~ SWBAT Use similarity theorems to prove that two triangles are similar

A.   Angle – Angle Similarity Theorem -- AA

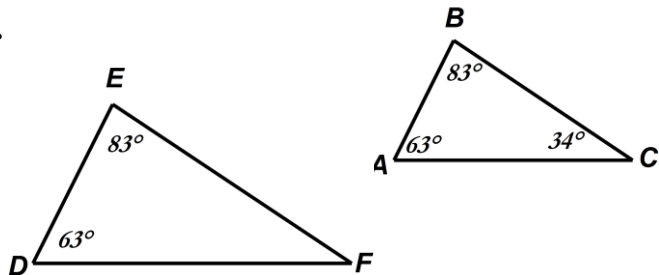**B. Side-Side-Side Similarity Theorem -- SSS**
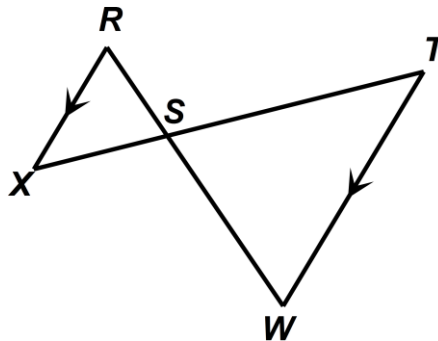

C. Side-Angle-Side Similarity Theorem -- SAS

Examples: Determine if the following triangles are similar.
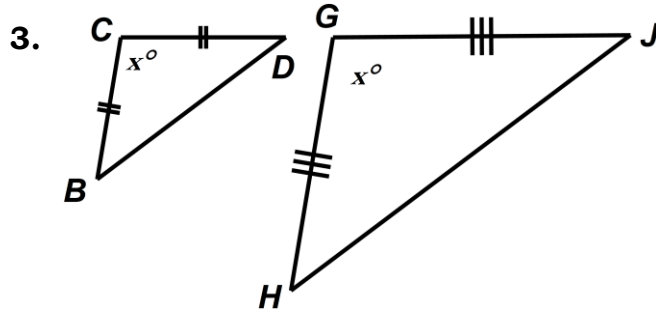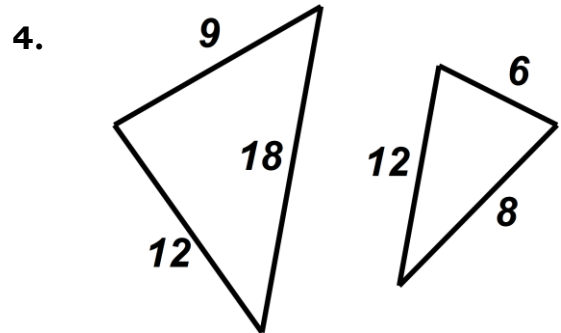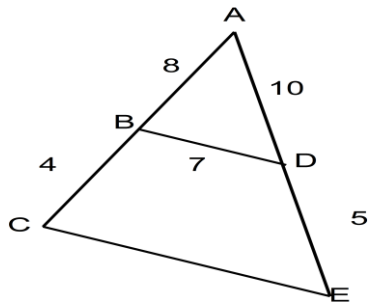
1.

2.

_____

_____

_____

_____

Are the following triangles similar? If so, explain why.

3.

4.

_____

_____

5. Make them separate!

6. Make them separate!

_____

_____
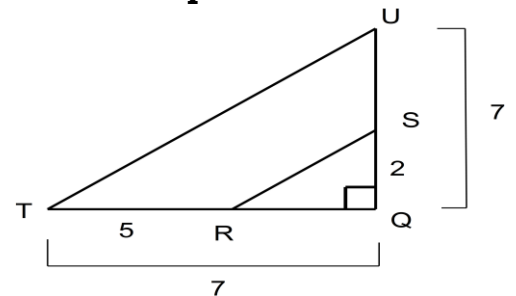
Find the measure in the following triangles (if possible).
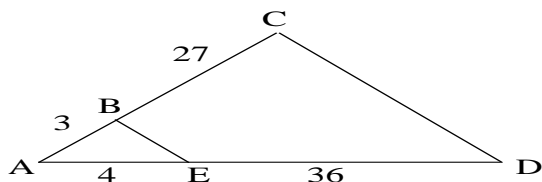
7.

8.

OJECTIVES ~ SWBAT Use proportionality theorems to calculate segment lengths

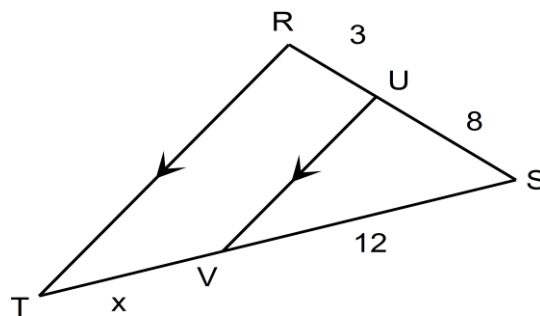**Triangle Proportionality (LADDER) Theorem~**
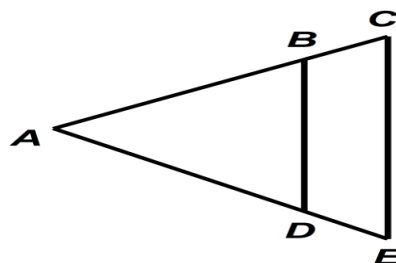
Examples:

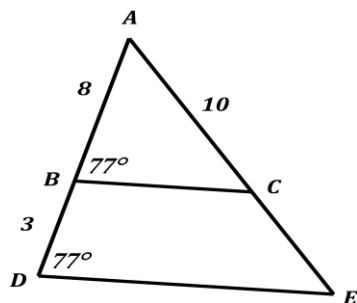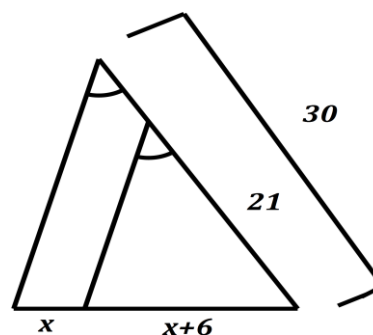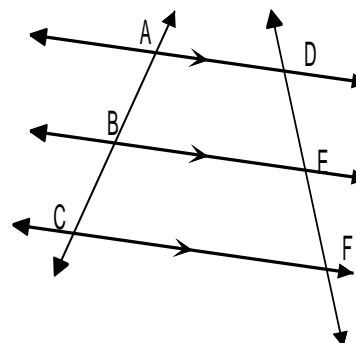**1. Use the diagram to find if $\overline{BE} \parallel \overline{CD}$?**

2. Find x
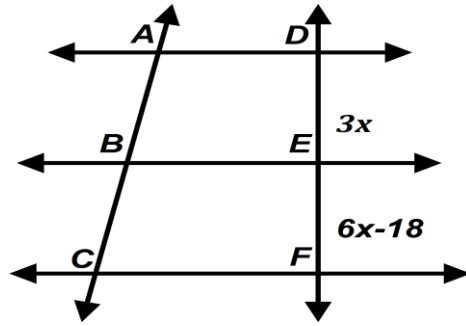
3. Find AE

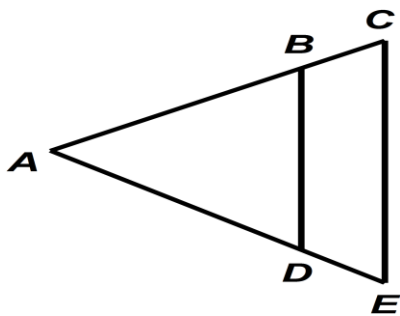**4. Find x**
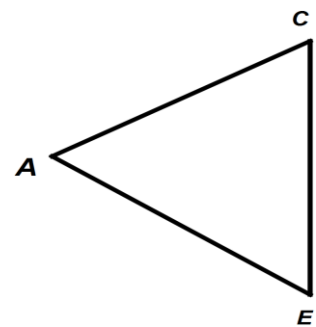
Congruent Parts of Parallel Lines
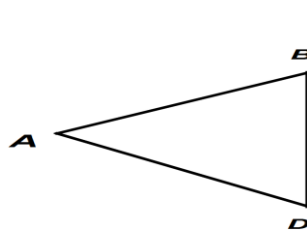
Examples:

5. Given $\overline{AB} \cong \overline{BC}$, find FE
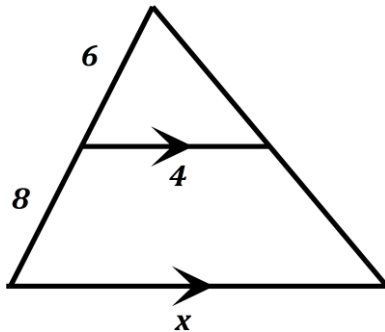

Triangle Proportionality (LADDER) Theorem~

OR
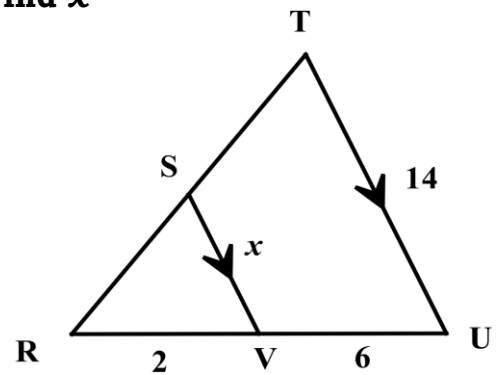
Examples:
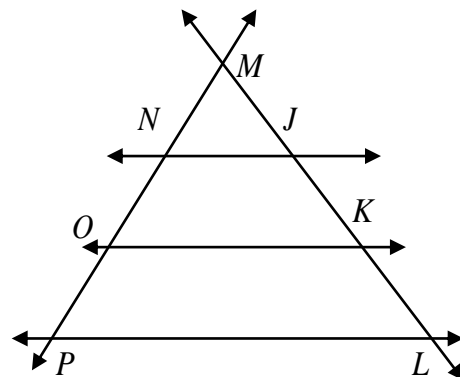**6.** Find x

7. Find x

Day 5 Proportions and Similar Triangles – Segment Lengths

OJECTIVES ~ SWBAT Use proportionality theorems to calculate segment lengths

Use the figure to complete the proportions
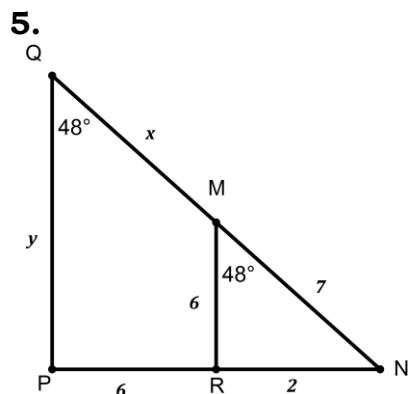## Assume the three triangles are proportional.

1. $\dfrac{MN}{NO} = \dfrac{MJ}{?}$

2. $\dfrac{JK}{KL} = \dfrac{?}{OP}$

3. $\dfrac{NJ}{OK} = \dfrac{MJ}{?}$

4. $\dfrac{PL}{NJ} = \dfrac{?}{MN}$

Find the following variables.

5.

Determine the length of each segment.

6. $\overline{AG}$

7. $\overline{FC}$

8. $\overline{ED}$

9. $\overline{AE}$