# Station #1:

## I am able to solve problems by using and simplifying ratios.

**Simplify the ratio.**

1. $12 : $16
   3 : 4

2. 7 cm : 14 mm
   5 : 1

3. 28 oz : 2 lb
   7 : 8

4. $\frac{9 \text{ ft}}{15 \text{ yd}}$
   1 : 5

5. 3 gallons : 10 quart
   6 : 5

6. $\frac{6 \text{ cm}}{14 \text{ cm}}$
   $\frac{3}{7}$

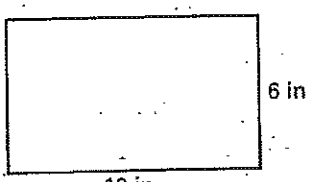
7. $\frac{32 \text{ in.}^2}{8 \text{ in.}^2}$
   $\frac{4}{1}$

8. 81 cm : 3 cm
   27 : 1

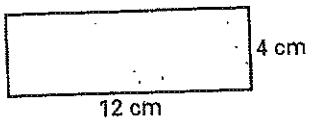
9. $\frac{10 \text{ in.}}{2 \text{ ft}}$
   $\frac{5}{12}$

10. $\frac{60 \text{ mi}}{51 \text{ mi}}$
    $\frac{20}{17}$

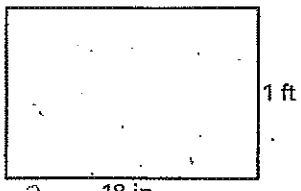
**Find the ratio of the width to the length of the rectangle. Then simplify the ratio.**

11. 

$\frac{6}{10} = \frac{3}{5}$

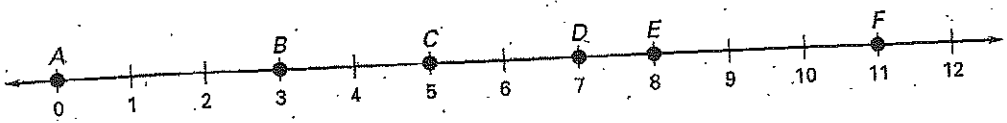
12. 

$\frac{4}{12} = \frac{1}{3}$

13. 

$\frac{12}{18} = \frac{2}{3}$

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




14. $\frac{AB}{CF}$ $\frac{3}{6} = \frac{1}{2}$

15. $\frac{BF}{CD}$ $\frac{8}{2} = \frac{4}{1}$

16. $\frac{BE}{AD}$ $\frac{5}{7}$

17. $\frac{DE}{AC}$ $\frac{1}{5}$

**Find the measures of the angles of the triangle, given the extended ratio.**

18. 1 : 7 : 10
    10°, 70°, 100°

19. 5 : 6 : 7
    50°, 60°, 70°

20. 7 : 14 : 15
    35°, 70°, 75°

# Station #2:

## I am able to find the geometric mean and solve problems using proportions.

**Find the geometric mean of the two numbers. Leave answer in simplest radical form.**

1. 5 and 20 $\sqrt{100}=10$
2. 45 and 5 $\sqrt{225}=15$
3. 6 and 15 $\sqrt{90}=3\sqrt{10}$
4. 3 and 27 $\sqrt{81}=9$
5. 40 and 5 $\sqrt{200}=10\sqrt{2}$
6. 6 and 24 $\sqrt{144}=12$

**Solve the proportion.**

7. $\frac{5}{8}=\frac{20}{y}$ $y=32$
8. $\frac{z+2}{4}=\frac{27}{12}$ $z=7$
9. $\frac{3}{x}=\frac{1}{x-6}$ $x=9$
10. $\frac{12}{x}=\frac{x}{4}$ $x=\sqrt{48}=4\sqrt{3}\approx 6.9$
11. $\frac{3}{m+5}=\frac{2}{m+1}$ $m=7$
12. $\frac{4}{5}=\frac{x}{15}$ $x=12$
13. $\frac{2}{k-1}=\frac{5}{3k-4}$ $k=3$
14. $\frac{8}{z-2}=\frac{z+2}{4}$ $z=\pm 6$
15. $\frac{y-2}{2}=\frac{2y-3}{5}$ $y=4$

**Story Problems:**

16) **Swimming Pool** A rectangular swimming pool is 24 feet long and 10 feet wide. Write the ratio of the pool's width to its length in simplest form. 5:12

17) **Class Size** In a high school where the ratio of seniors to underclassmen is 1 : 5, there are 125 seniors. How many underclassmen are there? 625 underclassmen

18) **Election** Three candidates run for an office in a local election. In all, 12,936 votes are cast, and the breakdown of votes for the three candidates is in the extended ratio 3 : 4 : 5. Find the actual numbers of votes cast for the three candidates. $x=1078$, so 3,234; 4,312; 5,390

19) **Television** The aspect ratio of a television screen is the ratio of the screen's width to its height. A widescreen TV has an aspect ratio of 16 : 9.

**a.** What is the height of a widescreen TV if its width is 26 inches? 14.625 in

**b.** What is the width of a widescreen TV if its height is 13 inches? 23.1 in

**c.** A television screen has a width of 28 inches and a height of 21 inches. What is the aspect ratio of this screen? 4:3

# Station #3:

## I am able to use proportions to solve geometry problems.

**Copy and complete the statement.**

1. If $\frac{a}{x} = \frac{b}{5}$, then $\frac{a}{b} = \frac{?}{?}$. $\frac{x}{5}$

2. If $\frac{7}{12} = \frac{31}{y}$, then $\frac{19}{12} = \frac{?}{?}$. $\frac{31+y}{y}$

3. If $\frac{z}{x} = \frac{y}{c}$, then $\frac{c}{y} = \frac{?}{?}$. $\frac{x}{z}$

4. If $\frac{3}{4} = \frac{5}{x+2}$, then $\frac{7}{4} = \frac{?}{?}$. $\frac{x+7}{x+2}$

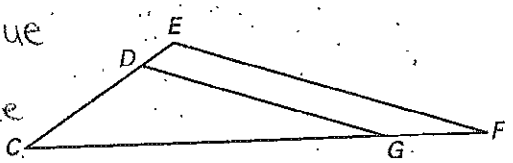
**In the diagram, $\frac{DE+CD}{CD} = \frac{GF+CG}{CG}$. State whether the indicated proportion is *true* or *false*.**

5) $\frac{DE}{CD} = \frac{GF}{CG}$ True

6) $\frac{DE}{CD} = \frac{GF}{CF}$ False

7) $\frac{CD}{DE} = \frac{CG}{GF}$ True

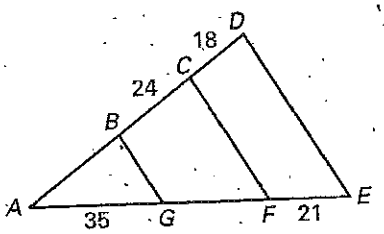
8) $\frac{DE}{CE} = \frac{GF}{CF}$ True




**In the diagram, $\frac{AB}{CD} = \frac{AG}{FE}$ and $\frac{AB}{AC} = \frac{AG}{AF}$. Find the unknown length.**

9) Find $AB$. 30

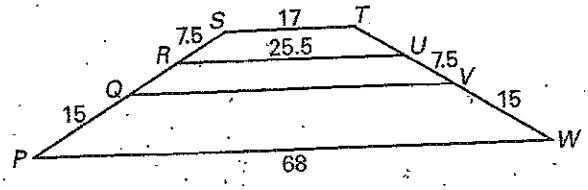
10) Find $GF$. 28




**In the diagram, $\frac{PQ}{QR} = \frac{WV}{VU}$, $\frac{QR}{RS} = \frac{VU}{UT}$, and $\frac{PW}{QV} = \frac{QV}{ST}$. Find the unknown length.**

11) Find $UT$. 7.5

12) Find $QV$. 34




**The length of a feature in a scale model is given along with the corresponding length of the actual object. Find the scale of the model.**

13) Length in model: 6.5 inches; Actual length: 91 inches 1:14

14) Length in model: 9.6 centimeters; Actual length: 3.2 centimeters 3:1

**The scale of a map and the distance between two points on the map is given. Find the actual distance between the locations represented by the points.**

15) Scale: 4 inches : 1 mile; Map distance: 10.5 inches 2.625 or $2\frac{1}{2}$ miles

16) Scale: 1 inch : 25 miles; Map distance: 3.2 inches 80 miles

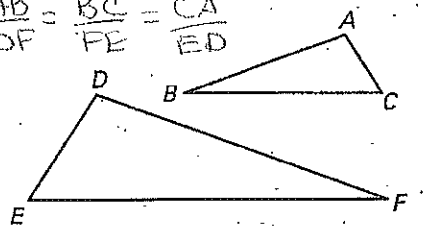
# Station #4:

## I am able to use proportions to identify similar polygons.

**List all pairs of congruent angles for the figures. Then write the ratios of the corresponding sides in a statement of proportionality.**

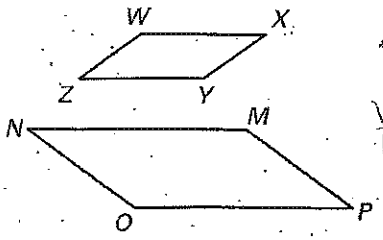
**1.** $\triangle ABC \sim \triangle DFE$

$\frac{AB}{DF} = \frac{BC}{FE} = \frac{CA}{ED}$




$\angle A \cong \angle D$, $\angle B \cong \angle F$, $\angle C \cong \angle E$

**2.** $WXYZ \sim MNOP$



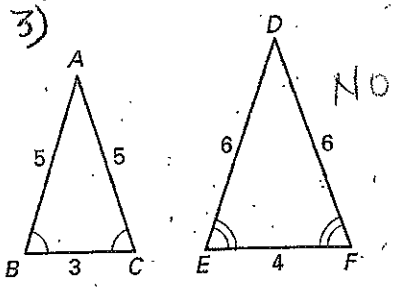

$\angle W \cong \angle M$, $\angle X \cong \angle N$

$\angle Y \cong \angle O$, $\angle Z \cong \angle P$

$\frac{WX}{MN} = \frac{XY}{NO} = \frac{YZ}{OP} = \frac{ZW}{PM}$

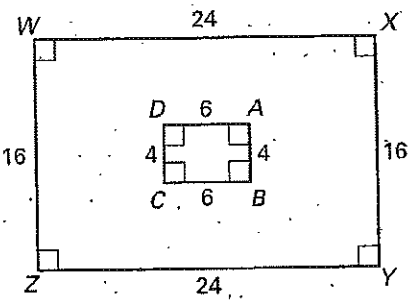
**Determine whether the polygons are similar. If they are, write a similarity statement and find the scale factor.**

3)




NO

4)




similarity statement

Yes

$WXYZ \sim DABC$

Scale factor: 4:1

**In the diagram, *WXYZ* ~ *MNOP*.**

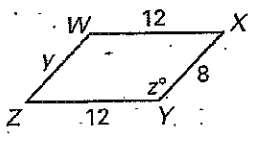
5) Find the scale factor of *WXYZ* to *MNOP*. 4:5

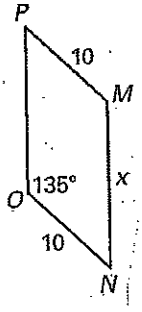
6) Find the values of $x$, $y$, and $z$. $x = 15$, $y = 8$, $z = 135$

7) Find the perimeter of *WXYZ*. 40 units

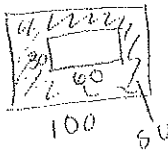
8) Find the perimeter of *MNOP*. 50 units

9) Find the ratio of the perimeter of *MNOP* to the perimeter of *WXYZ*. $\frac{5}{4}$




10) **Swimming Pool** The community park has a rectangular swimming pool enclosed by a rectangular fence for sunbathing. The shape of the pool is similar to the shape of the fence. The pool is 30 feet wide. The fence is 50 feet wide and 100 feet long.




a) What is the scale factor of the pool to the fence? $\frac{3}{5}$

b) What is the length of the pool? 60 feet

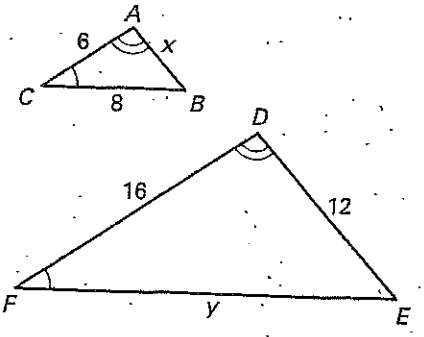
c) Find the area reserved strictly for sunbathing. 3,200 $ft^2$

# Station #5:

## I am able to use the AA Similarity Postulate.

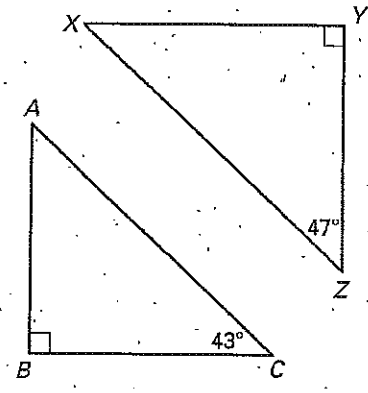
**Use the diagram to complete the statement.**

1. $\triangle ABC \sim$ ? $\triangle DEF$
2. $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{?}$ FD
3. $\angle B \cong$ ? $\angle E$
4. $\frac{?X}{12} = \frac{8}{?y}$
5. $x =$ ? 4.5
6. $y =$ ? 21.3 or 21 1/3



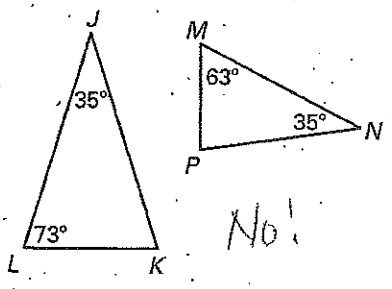

**Determine whether the triangles are similar. If they are, write a similarity statement.**

7.



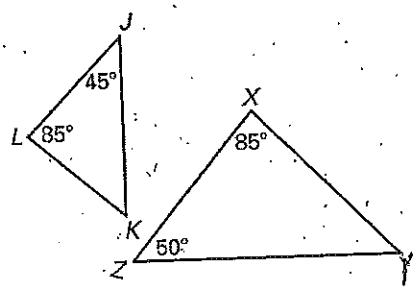

Yes, AA
$\triangle ABC \sim \triangle ZYX$

8.



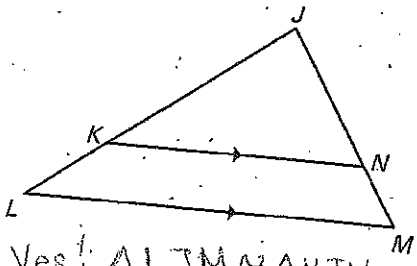

No!

9.



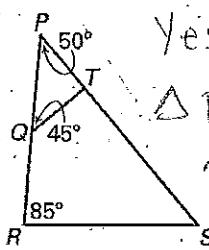

Yes, AA
$\triangle JLK \sim \triangle YXZ$

10.



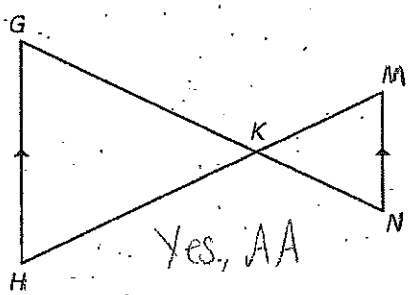

Yes! $\triangle LJM \sim \triangle KJN$

11.



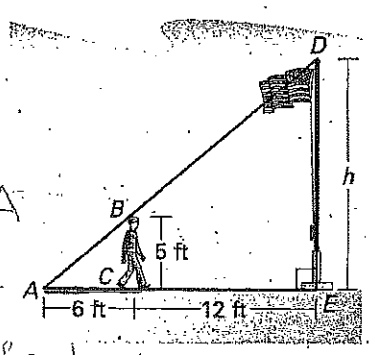

Yes, AA
$\triangle PTQ \sim \triangle PRS$

12.




Yes, AA
$\triangle GKH \sim \triangle NKM$

13) **Flag Pole** In order to estimate the height $h$ of a flag pole, a 5 foot tall male student stands so that the tip of his shadow coincides with the tip of the flag pole's shadow. This scenario results in two similar triangles as shown in the diagram.




a) Why are the two overlapping triangles similar? By AA

b) Using the similar triangles, write a proportion that models the situation. $\frac{5}{6} = \frac{h}{18}$

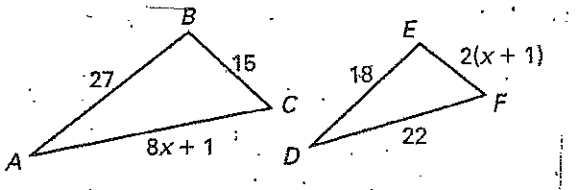
c) What is the height $h$ (in feet) of the flag pole? $h = 15$ feet

# Station #6:

## I am able to use the SSS and SAS Similarity Postulate.

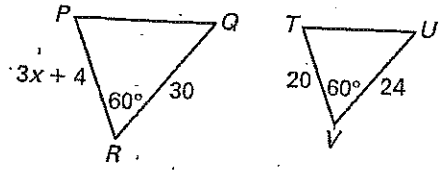
1) **Find the value of *x* that makes $\triangle ABC \sim \triangle DEF$.**

$x = 4$



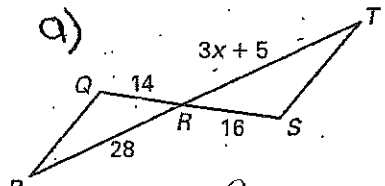

2) **Find the value of *x* that makes $\triangle PQR \sim \triangle TUV$.**

$x = 7$



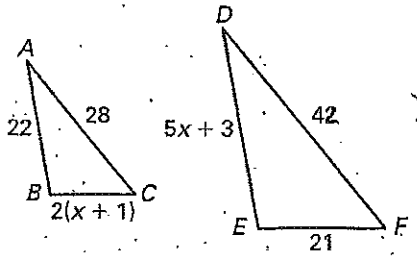

3) **Find the value of *x* that makes the triangles similar.**

a)



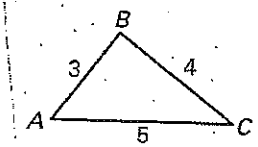

$x = 9$

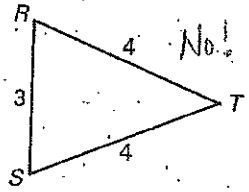
b)



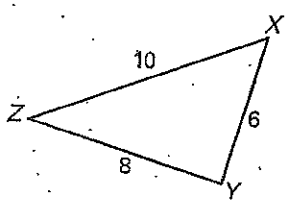

$x = 6$

4) **Is either $\triangle RST$ or $\triangle XYZ$ similar to $\triangle ABC$?**



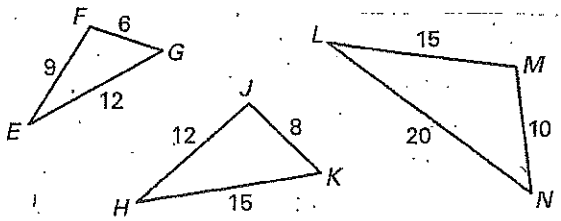

No!




Yes! SSS

5) Which of the three triangles are similar? Write a similarity statement.

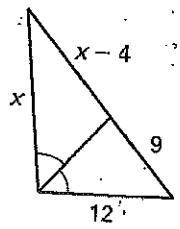
$\triangle FGE \sim \triangle MNL$



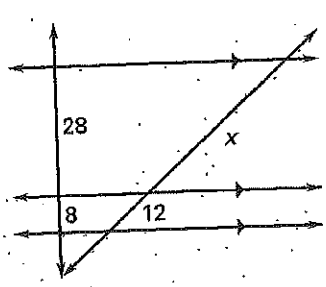
# Station #7:

## I am able to use the proportions with a triangle or parallel lines.

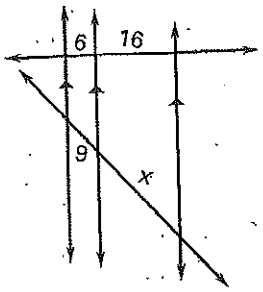
**Find the value of x.**

1. 

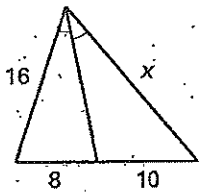
x = 16

2. 

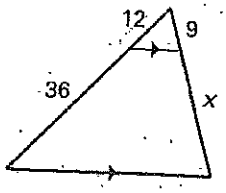
x = 42

3. 

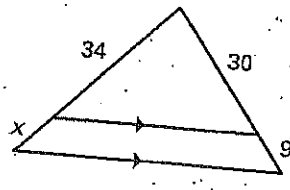
x = 24

4. 

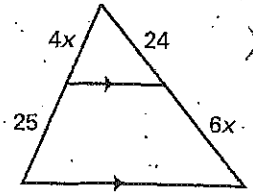
x = 20

5. 

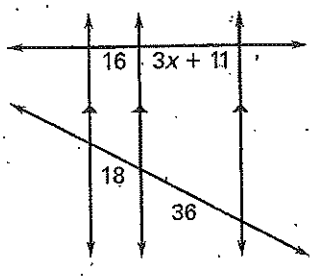
x = 27

6. 

x = 10.2

7. 

x = 5

8. 

x = 7