

Ratios: the comparison of two numbers

Proportions: when two ratios are set = to each other

Solve Proportions by cross multiplying

Solve the following proportions.

1. $\frac{1}{x} = \frac{6}{x+5}$

2. $\frac{20-x}{x} = \frac{6}{4}$

3. $\frac{4}{12} = \frac{x+2}{2x+13}$

Extended Ratios: when more than two numbers are used

Use Let statements

Solve the following extended ratios.

4. The angles of a triangle are in the ratio of $5:7:8$. Find the measure of each angle.

5. The sides of a quadrilateral are in the ratio of $2:7:9:13$. The perimeter of the quadrilateral is $217m$. Find the length of each side.

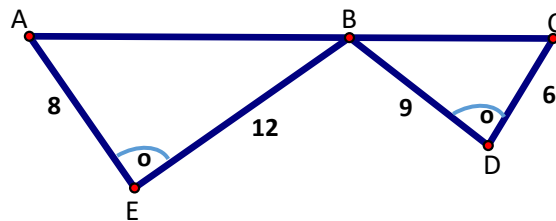
Similarity Ratios: the ratio comparing two corresponding sides of similar figures

-You must match up the corresponding sides. (sides that are in the same position)

Match the smallest of one with the smallest of the other, the largest of one with the largest of the other, etc.

6. Given the triangles below...

A) Identify corresponding congruent angles:



B) Identify corresponding sides that are proportional.

C) Find the similarity ratio: _____

D) Write the similarity statement: _____

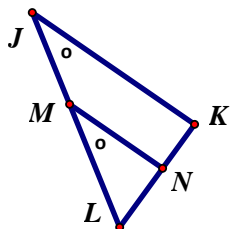
Similarity Statements: a statement that tells that two figures are similar by matching up their corresponding vertices.

Figures may be similar by 3 criteria: $AA \sim$, $SSS \sim$, $SAS \sim$

For each of the following, determine if the two triangles are similar and if so by what criteria ($AA \sim$, $SSS \sim$, $SAS \sim$)?

And write a similarity statement.

7.

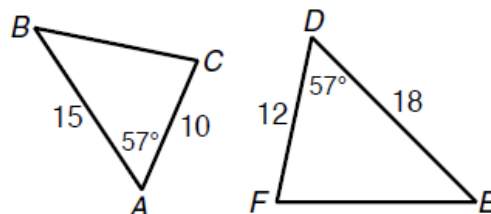


Yes or No

Criteria: _____

Δ _____ \sim Δ _____

8.

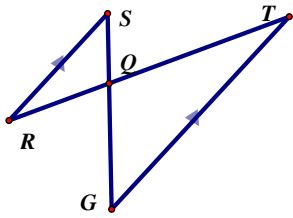


Yes or No

Criteria: _____

Δ _____ \sim Δ _____

9.

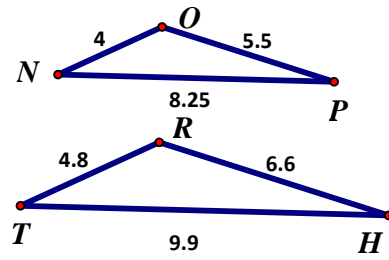


Yes or No

Criteria: _____

Δ _____ \sim Δ _____

10.

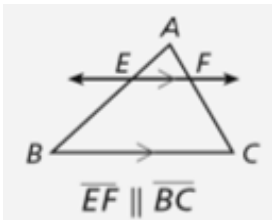


Yes or No

Criteria: _____

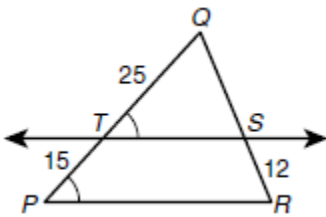
Δ _____ \sim Δ _____

Side – Splitter Thm: If a line is parallel to a side of a triangle, it splits the other 2 sides PROPORTIONALLY.

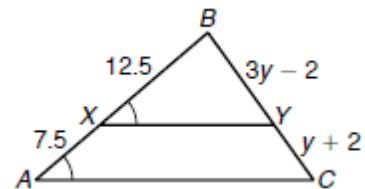


Write the proportion and find the length of the segment.

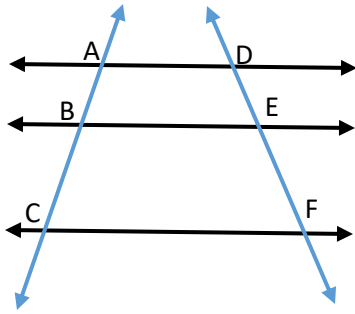
11. Find length of QS .



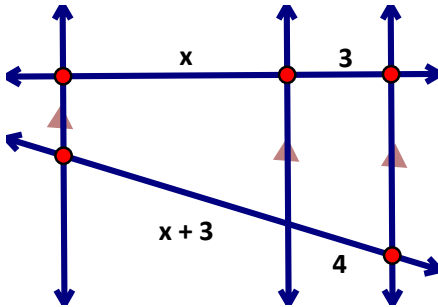
12. Find the length of BY & YC .



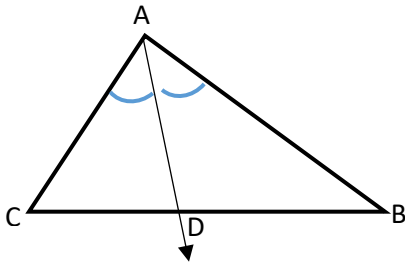
Transversal Proportionality: If 3 or more parallel lines are intersected by 2 transversals, then they divide the Transversals proportionally.



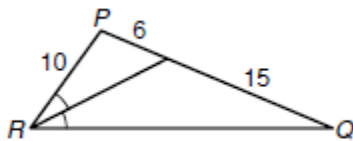
Write a proportion and find the value of x .
13.



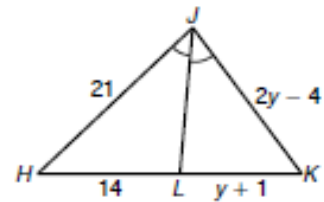
Triangle Angle Bisector Thm: An \sphericalangle Bisector of a triangle, bisects the opposite side into segments that are proportional with the other two sides.



14. Find the length of RQ .

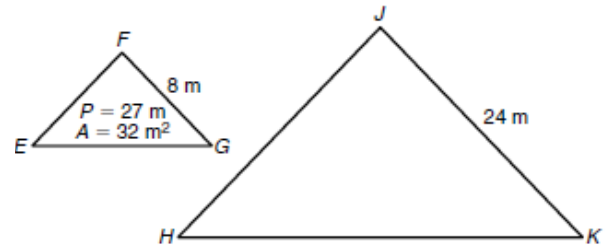


15. Find JK & LK .



Similarity Ratio	Perimeter Ratio	Area Ratio
Ratio of corresponding sides As a fraction	Perimeter Ratio = \sim Ratio	Area Ratio = $(\sim \text{Ratio})^2$

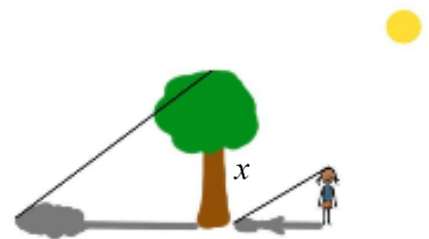
16. $\triangle EFG \sim \triangle HJK$. Find the area and perimeter of $\triangle HJK$.



Indirect Measurement: Set up a proportion based on corresponding sides.

- **Shadow Problems** with $\sim \Delta$'s
- **Scale problems**
- **Scale models.**

17. Sally is standing next to a tree that casts a shadow 24 ft long. Sally is 5 ft tall and casts a shadow 6.5 ft long. How tall is the tree (to the nearest tenth of a foot)? Label the diagram, write a proportion and solve for x .



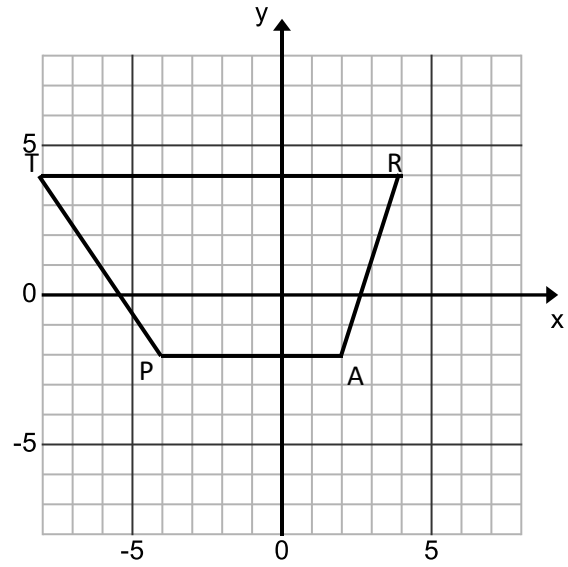
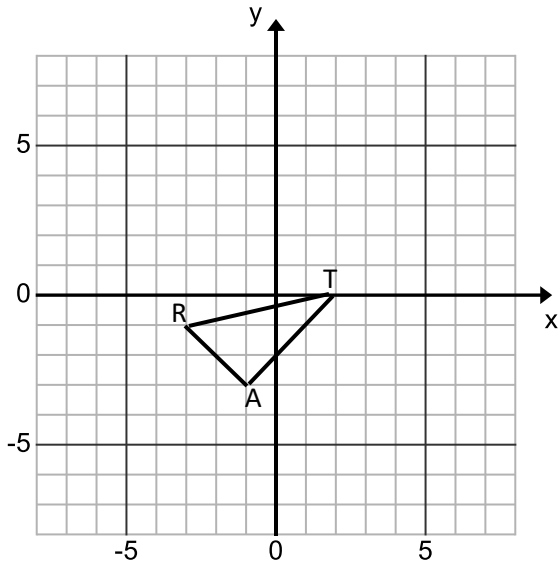
18. An Olympic sized swimming pool is a rectangle that measures 50 m in length and 25 m in width. Using a scale of $1.5 \text{ in} : 10 \text{ m}$, find the length and width of your model pool. Draw a diagram to support your answer.

Dilations on the Coordinate Plane:

$$(x, y) \xrightarrow{D_{origin, k}} (k \cdot x, k \cdot y)$$

19. $D_{origin, 2}(\triangle RAT)$

20. $D_{origin, \frac{1}{4}}(TRAP)$



Show all coordinates using arrow notation.

Using Dilations to prove Similar Triangles: $AA \sim$, $SSS \sim$, $SAS \sim$

21. **Given** the points $A(5, -4)$, $B(-1, -2)$, $C(3, 0)$, $D(-4, -1)$ and $E(2, 2)$

Prove: $\triangle ABC \sim \triangle ADE$ using $AA \sim$ **Method.**

