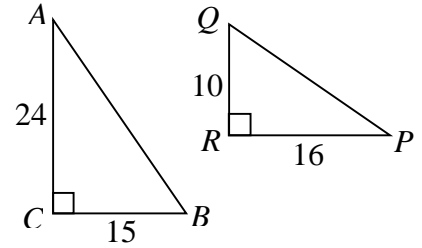


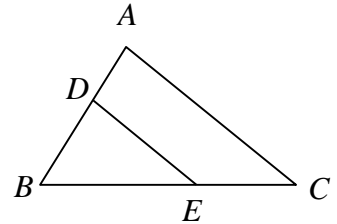
### Geometry HW: Similarity - Review

- In the diagram at right, explain how we know that  $\triangle ABC \sim \triangle PQR$ .
  - Describe a similarity transformation that would take  $\triangle ABC$  onto  $\triangle PQR$ .



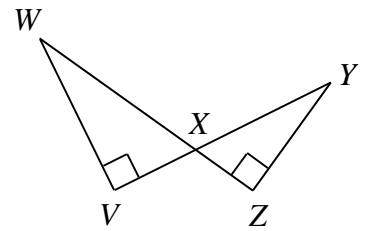
- In parallelogram  $ABCD$ ,  $E$  is the midpoint of  $\overline{DC}$  and  $F$  is the midpoint of  $\overline{AD}$ . If  $FE = 2x + 1$  and  $AC = 6x - 5$ , what is the length of diagonal  $\overline{AC}$ ?
- The midpoints of the sides of an equilateral triangle are joined to form a smaller triangle of perimeter 24. Find the length of one side of the original triangle.
- Three sides of a triangle measure 10, 12, and 18. Find the perimeter of a similar triangle whose longest side measures 7.2.
- If the altitude to the hypotenuse of a right triangle divides the hypotenuse into segments measuring 8 and 32, find the length of the altitude.
- Triangle  $ABC$  has area 64. If  $D$  is the midpoint of  $\overline{AC}$  and  $E$  is the midpoint of  $\overline{BC}$ , find the area of  $\triangle DEC$ .

7. In  $\triangle ABC$  at right,  $\overline{DE} \parallel \overline{AC}$ ,  $DB = 9$ ,  $AD = 3$ , and  $DE = 12$ . Find  $AC$ .



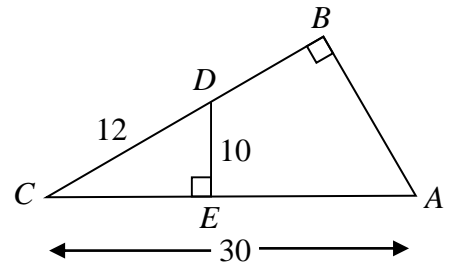
8. In  $\triangle RST$ ,  $Y$  is on side  $\overline{RS}$  and  $Z$  is on side  $\overline{RT}$  such that  $\overline{YZ} \parallel \overline{ST}$ .  
If  $RY = x$ ,  $YZ = x + 8$ ,  $YS = 3$ , and  $ST = 2x + 1$ , find the numerical value of  $RY$ .
9. In right  $\triangle PQR$ ,  $\overline{QS}$  is the altitude to hypotenuse  $\overline{PR}$ . If  $SR$  is 1 more than  $PS$  and  $PQ$  is 2 more than  $PS$ , find  $PS$ .
10. The Pyramid of Menkaure was originally 69 meters high. The earlier Pyramid of Khufu was originally 146 meters high. They were designed to be similar.
- The angle of at which the sides of Khufu sloped up was  $52^\circ$ . At what angle did the sides of Menkaure slope up?
  - The length of the base of Menkaure was 108.7 meters. What was the length of the base of Khufu?
  - The exposed surface area of Menkaure as (approximately) 19,100 square meters. What was the surface area of Khufu?
  - The volume of Menkaure was (approximately) 271,760 cubic meters. What was the volume of Khufu?

11. In the diagram at right, if  $VW = 15$ ,  $WX = 17$  and  $YZ = 12$ , find  $XZ$ .

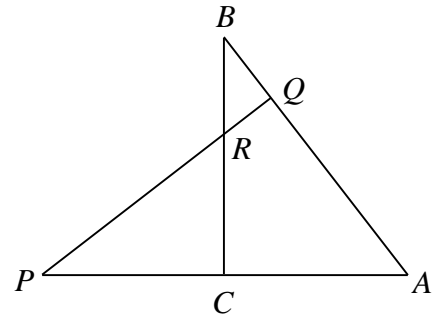


12.  $\triangle ABC \sim \triangle DEF$  and the ratio of the perimeters of the triangles is 5:4. If  $m\angle A = 50^\circ$ , find

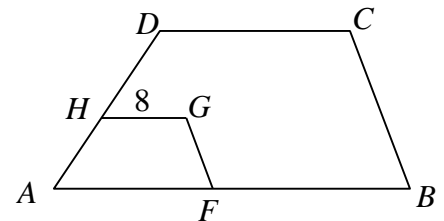
13. In  $\triangle ABC$ ,  $\overline{AB} \perp \overline{BC}$  and  $\overline{DE} \perp \overline{CA}$ . If  $DE = 10$ ,  $CD = 12$ , and  $CA = 30$ , find  $AB$ .



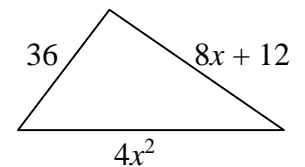
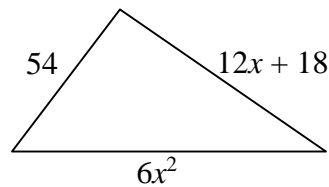
14. In the diagram at right,  $\overline{BC} \perp \overline{PA}$ ,  $\overline{PQ} \perp \overline{AB}$ ,  $BQ = 1$ ,  $PC = 9$ , and  $AQ$  is three more than  $AC$ . Find the numerical value of  
 a.  $AC$                       b.  $BC$                       c.  $CR$



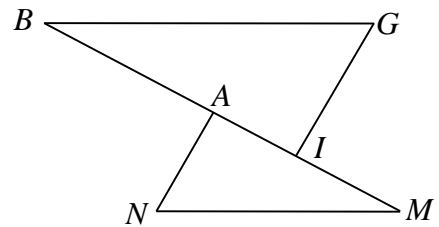
15. In the diagram at right, trapezoid  $ABCD$  is similar to trapezoid  $AFGH$ . If  $AF:FB = 2:3$  and  $HG = 8$ , find the length of  $DC$ .



16. Determine if the two triangles shown at right are similar and justify your answer.



17. Given:  $\overline{BG} \parallel \overline{NM}$ ,  $\overline{BAIM}$ ,  $\overline{AN} \perp \overline{BM}$  and  $\overline{IG} \perp \overline{BM}$
- Prove:  $\triangle BIG \sim \triangle MAN$
  - If  $BG = 39$ ,  $NM = 30$  and  $BI = 36$ , find the lengths of  $IG$  and  $AN$ .



## STUFF YOU SHOULD KNOW:

### Definition of similar polygons

One is the image of the other after a similarity transformation ( dilation plus rigid motion)

All pairs of corresponding angles are congruent AND

All pairs of corresponding sides are in proportion (same ratio)

If the ratio of two corresponding sides of a polygon is  $a:b$ , then

The ratio of any pair of corresponding lengths will be  $a:b$ .

The ratio of corresponding areas will be  $(a:b)^2$ .

The ratio of corresponding volumes will be  $(a:b)^3$ .

### Ways to prove two triangles congruent

AA

SAS~

SSS~

If a line intersects two sides of a triangle and is parallel to the third side, then

Two similar triangles are formed

DRAW TWO SEPARATE TRIANGLES

If a segments joins the midpoints of two sides of a triangle, then

It is parallel to the third side

It is half the length of the third side

It forms two similar triangles with ratio 1:2

The altitude to the hypotenuse of a right triangle creates three similar triangles

$$a^2 = Pp$$

$$L^2 = PH \text{ and } l^2 = pH$$

An angle bisector divides the opposite side in proportion with the sides that include the angle.