

*P.I. G.G.45: Investigate, justify, and apply theorems about similar triangles*

1. Complete the following when  $\triangle IJK \sim \triangle LMN$ .

a)  $m\angle K = m\angle$  \_\_\_\_\_

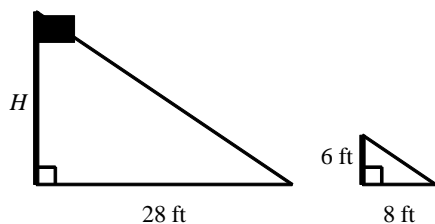
b)  $\frac{KI}{JI} = \frac{NL}{?}$

2. In  $\triangle QRS$ ,  $QR=7$ ,  $RS=13$ , and  $m\angle R=46$ . In  $\triangle UVT$ ,  $VT=14$ ,  $TU=28$ , and  $m\angle T=46$ . State whether the triangles are similar, and if so, write a similarity statement.

3. Find the scale factor that maps  $\triangle ABC$  onto  $\triangle A'B'C'$  if  $A(-2, 0)$ ,  $B(0, 4)$ ,  $C(6, 0)$ ,  $A'(-3, 0)$ ,  $B'(0, 6)$ ,  $C'(9, 0)$ . How are the figures related? Explain.

4.  $\triangle ABC$  with vertices  $A(-2, 1)$ ,  $B(-2, 5)$ , and  $C(2, 4)$  is similar to  $\triangle MNO$  with vertices  $M(3, -1)$  and  $N(3, -9)$ . Find four possibilities for the coordinates of vertex  $O$ .

5. A lamppost is 6 feet high and casts an 8-foot shadow. At the same time of day, a flagpole directly behind the lamppost casts a 28-foot shadow.



Which proportion can be used to find the height,  $H$ , of the flagpole?

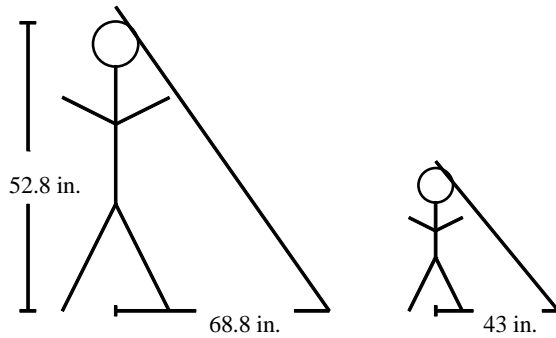
[A]  $\frac{H}{28} = \frac{6}{8}$

[B]  $\frac{H}{8} = \frac{6}{28}$

[C]  $\frac{8}{28} = \frac{H}{6}$

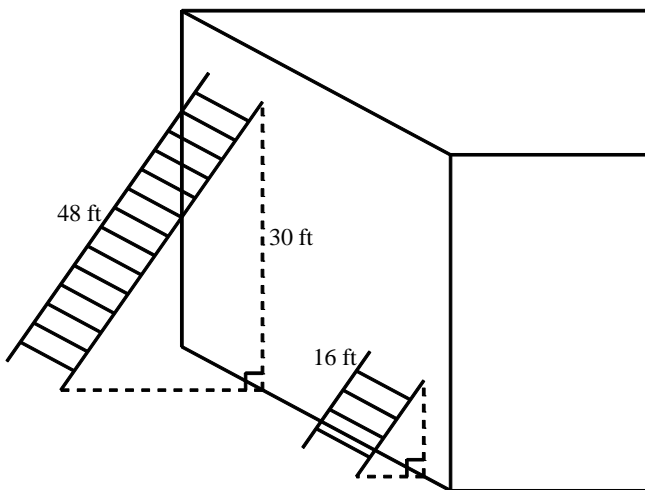
[D]  $\frac{H}{28} = \frac{8}{6}$

6. At the same time of day, a man who is 52.8 inches tall casts a 68.8-inch shadow and his son casts a 43-inch shadow. What is the height of the man's son?



- [A] 33 in.                      [B] 85.8 in.                      [C] 111.8 in.                      [D] 34 in.

7. Two ladders are leaning against a wall at the same angle as shown. How far up the wall does the shorter ladder reach?



- [A] 8 ft                      [B] 10 ft                      [C] 6 ft                      [D] 20 ft

[1] a)  $N$  b)  $ML$  \_\_\_\_\_

[2] not similar \_\_\_\_\_

[3]  $\frac{3}{2}$ ; they are similar because each side of  $\triangle ABC$  is proportional to the corresponding side of  $\triangle A'B'C'$ .  
\_\_\_\_\_

[4]  $(11, -7)$ ,  $(11, -3)$ ,  $(-5, -3)$ , or  $(-5, -7)$  \_\_\_\_\_

[5] A \_\_\_\_\_

[6] A \_\_\_\_\_

[7] B \_\_\_\_\_