Module 6b: Altitudes of Triangles

Math Practice(s):

-Attend to precision.

-Look for & make sense of structure.

Learning Target(s):

-Use altitudes in similar triangles to solve for missing values in triangles.

Homework:

HW#7: 6b #1-2

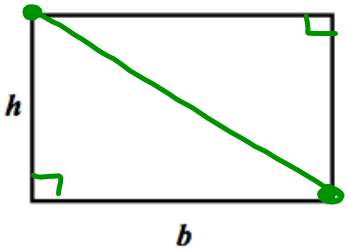
Aug 8-12:20 PM

Warm-up

1. Given the rectangle below with base length ***b*** and height ***h***, state an equation that represents the formula for determining the area, ***A***, of the rectangle.

$A = bh$

2. Draw a diagonal in the rectangle below (with base length ***b*** and height ***h***).



   A. What do you think is true about the two triangles that the diagonal created inside of the rectangle?

- rt △s
- same dimensions

   B. State an equation that represents the formula for determining the area, ***A***, of one of the triangles.

$A = \frac{1}{2} \cdot bh$ $A = \frac{bh}{2}$

3. Determine the area of the following triangles.

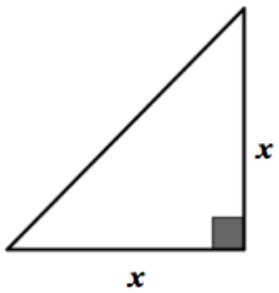
A.

$A = \frac{1}{2}(8)(15)$

$A = 4(15)$

$A = 60\ cm^2$

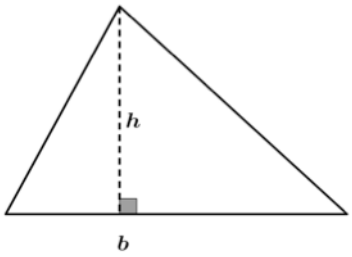
B.

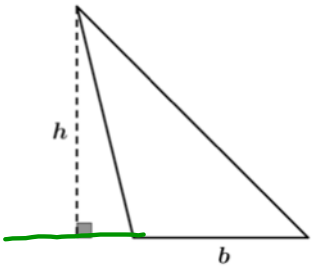


$A = \frac{1}{2}(x)(x)$

$A = \frac{1}{2}x^2$

When we want to compute the area of a non-right triangle, we must find an ***altitude*** to determine the "height" *(h)* of a triangle.

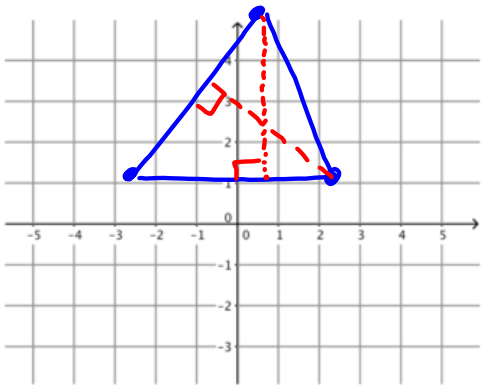




4. Graph the following points, then draw an altitude where you best see fit.

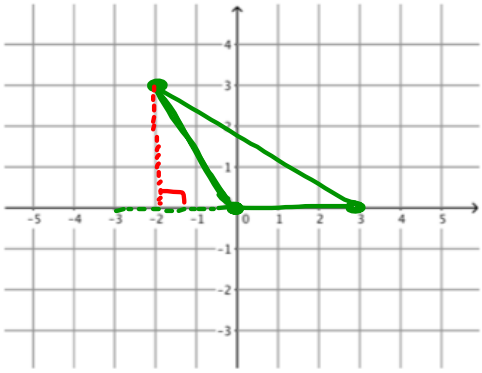
Example 1

Consider the triangle obtained by connecting the points (-2,0), (3,0), and (0,4).



Example 2

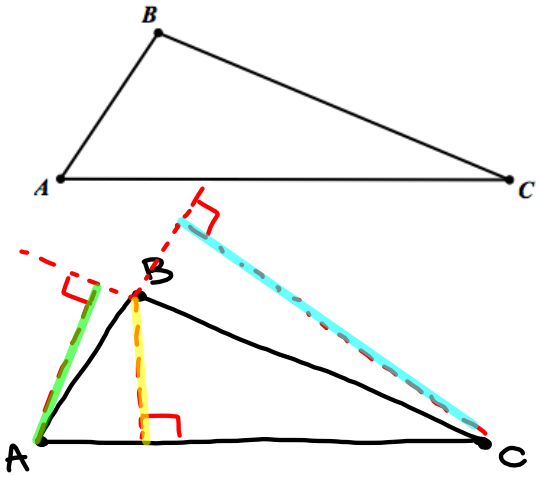
Consider the triangle obtained by connecting the points (0, 0), (-2, 3), and (3, 0).



erase to show

Altitude of a Triangle (#VOC): The perpendicular line segment from a vertex to its opposite side.

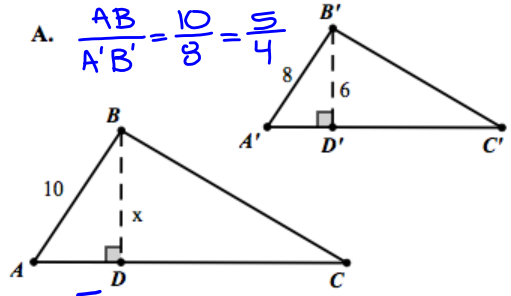
- Since a triangle has 3 vertices, each triangle has exactly 3 altitudes.



Nov 13-6:41 AM

5. Each pair of triangles shown is similar. Determine the value of *x*. *Figures are not to scale.

A. $\frac{AB}{A'B'} = \frac{10}{8} = \frac{5}{4}$



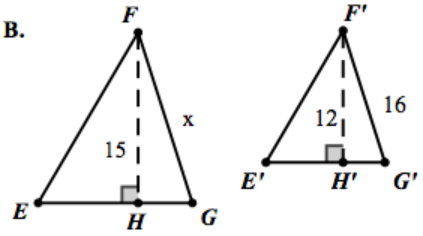
$\frac{x}{6} = \frac{5}{4}$

$4x = 30$

$x = \frac{15}{2}$ units

$x = 7.5$ units

B.

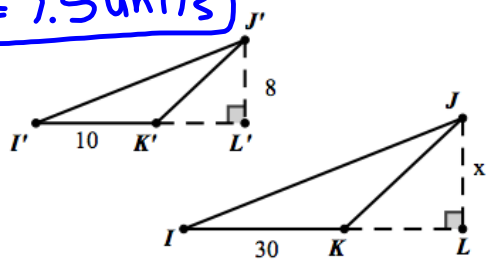


$\frac{FH}{F'H'} = \frac{15}{12} = \frac{5}{4}$ $\quad \frac{5}{4} = \frac{x}{16}$

$4x = 80$

$x = 20$ units

C.

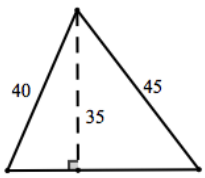


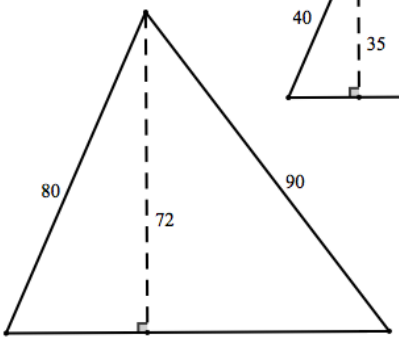
$\frac{I'K'}{IK} = \frac{10}{30} = \frac{1}{3}$

$\frac{1}{3} = \frac{8}{x}$

$x = 24$ units

6. Explain why the following pair of triangles is NOT similar.





$\frac{40}{80} = \frac{45}{90} = \frac{35}{72}$

$\frac{1}{2} = \frac{1}{2} = \frac{35}{72}$

To be similar, all dimensions must be proportional. Since the altitudes do not reduce to $\frac{1}{2}$, like the sides do, the entire pair of triangles are not similar.