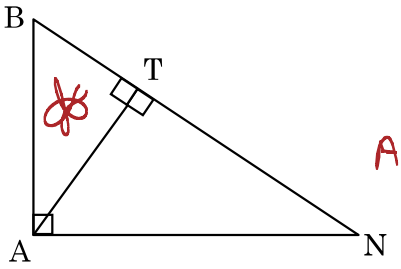
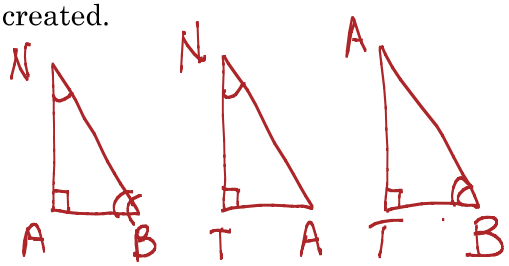
Worksheet 1 Altitude to the Hypotenuse Name _____

1) If an altitude is drawn to the hypotenuse of triangle BAN below, then name and redraw the 3 similar triangles created.

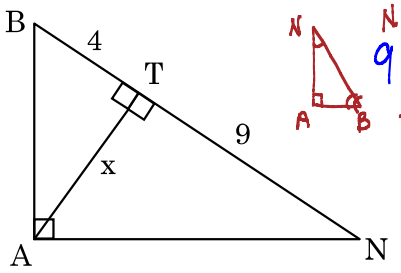


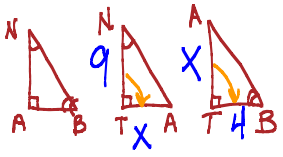


$\triangle NAB \sim \triangle NTA \sim \triangle ATB$

Find the missing value "x" below:

2)

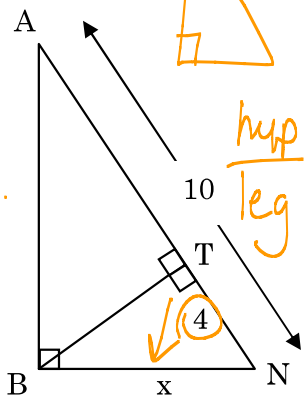




$\frac{9}{x} = \frac{x}{4}$

$x = 6$

3)

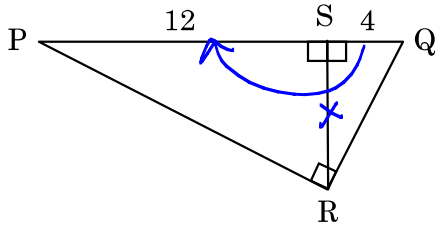


$\frac{\text{hyp}}{\text{leg}} : \frac{10}{x} = \frac{x}{4}$

$x = 2\sqrt{10}$

For 4-6 find the length of the altitude of right triangle PQR.

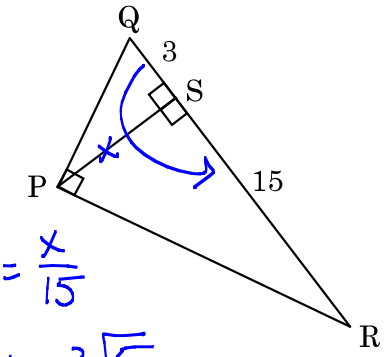
4)



$\frac{4}{x} = \frac{x}{12}$

$x = 4\sqrt{3}$

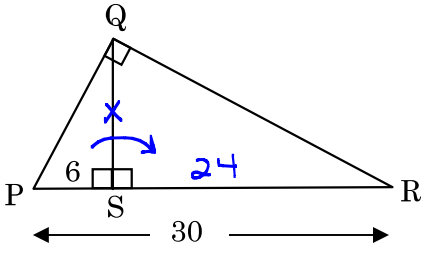
5)



$\frac{3}{x} = \frac{x}{15}$

$x = 3\sqrt{5}$

6)



$\frac{6}{x} = \frac{x}{24}$

$x = 6\sqrt{4}$

$x = 12$

Find the geometric mean of the following numbers.

7) 5 and 8

$\frac{5}{x} = \frac{x}{8} \rightarrow x^2 = 5 \cdot 8$

$x = 2\sqrt{10}$

8) 7 and 11

$x = \sqrt{77}$

9) 4 and 9

$x = 6$

10) 2 and 25

$x = 5\sqrt{2}$

11) 6 and 8

$2 \cdot 3 \cdot 2 \cdot 4$

$x = 4\sqrt{3}$

12) 8 and 32

$\sqrt{8 \cdot 8 \cdot 4}$

$x = 16$

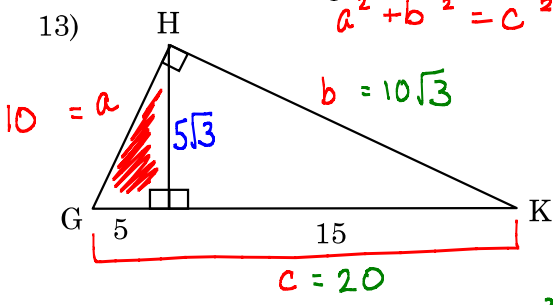
For 7-9 find the length of each leg of right triangle GHK. (find GH and HK)

Hint: find altitude first, then you can do similar triangles or Pythagorean Theorem.

$leg^2 + leg^2 = hyp^2$

$a^2 + b^2 = c^2$

13)



$10 = a$

$b = 10\sqrt{3}$

$c = 20$

$\frac{5}{x} = \frac{x}{15}$, $x = 5\sqrt{3}$

$(5\sqrt{3})^2 + 5^2 = a^2$

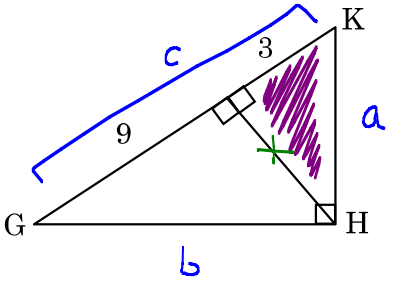
$75 + 25 = a^2$

$10^2 + b^2 = 20^2$

$b^2 = 300$

$b = 10\sqrt{3}$

14)



$\frac{3}{x} = \frac{x}{9} \rightarrow x = 3\sqrt{3}$

$3^2 + 3\sqrt{3}^2 = a^2$

$9 + 27 = a^2$

$36 = a^2$

$6 = a$

$b^2 + b^2 = 12^2$

$b^2 = 144 - 36$

$b^2 = 108$

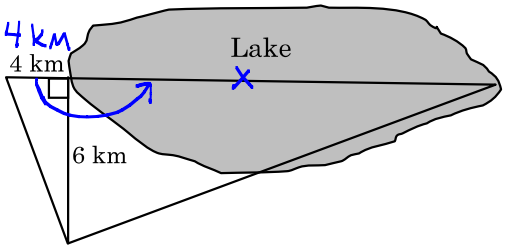
$b = 6\sqrt{3}$

108

9 12

4 3

15) How far is it across the lake?



$\frac{4}{6} = \frac{6}{x}$, $x = 9$ km