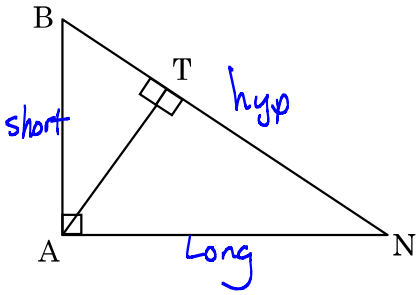
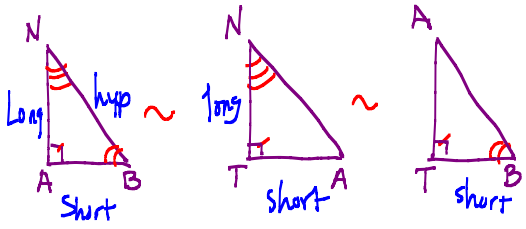
Worksheet 1 Altitude to the Hypotenuse Name _____

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

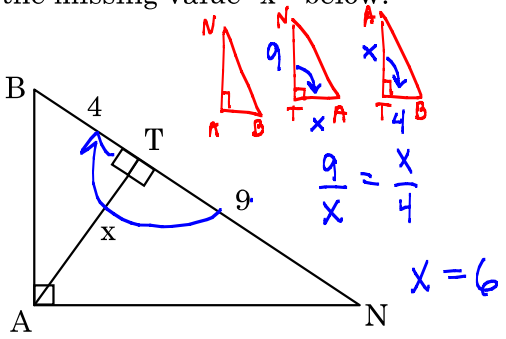




$\triangle NAB \sim \triangle NTA \sim \triangle ATB$

Find the missing value "x" below:

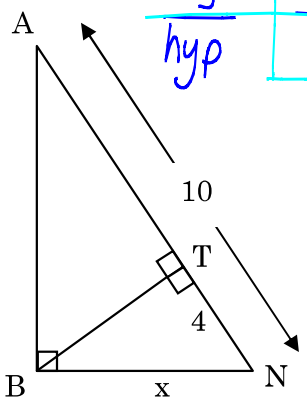
2)



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

$x = 6$

3)



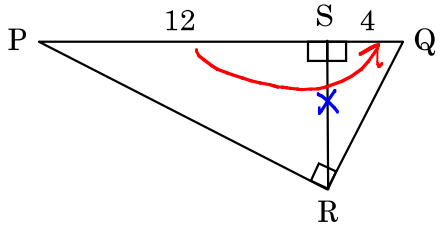
	Big	Little
leg	x	4
hyp	10	x

$x^2 = 4 \cdot 10$

$x = 2\sqrt{10}$

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

4)

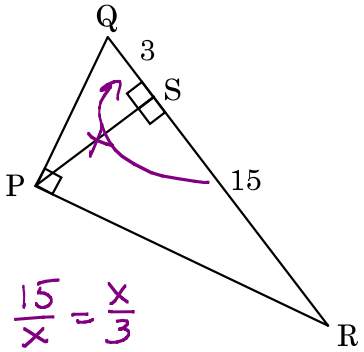


$\frac{12}{x} = \frac{x}{4}$

$x^2 = 4 \cdot 4 \cdot 3$

$x = 4\sqrt{3}$

5)

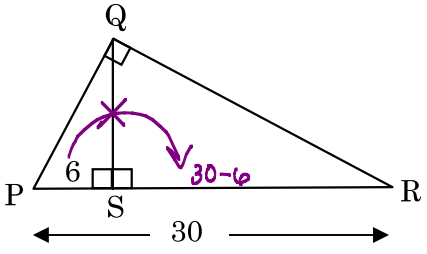


$\frac{15}{x} = \frac{x}{3}$

$x^2 = 3 \cdot 3 \cdot 5$

$x = 3\sqrt{5}$

6)



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

$x^2 = 6 \cdot 6 \cdot 4$

$x = 6\sqrt{4}$

$x = 12$

Find the geometric mean of the following numbers.

7) 5 and 8

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

$2\sqrt{10}=x$

8) 7 and 11

$x^2=77$

$x=\sqrt{77}$

9) 4 and 9

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

10) 2 and 25

$\frac{2}{x}=\frac{x}{25}$

$x^2=5\cdot 5\cdot 2 \rightarrow x=5\sqrt{2}$

11) 6 and 8

$\frac{6}{x}=\frac{x}{8}$

$x^2=2\cdot 3\cdot 2\cdot 4 \rightarrow x=4\sqrt{3}$

12) 8 and 32

$\frac{8}{x}=\frac{x}{8\cdot 4}$

$x^2=8\cdot 8\cdot 2\cdot 2 \rightarrow x=16$

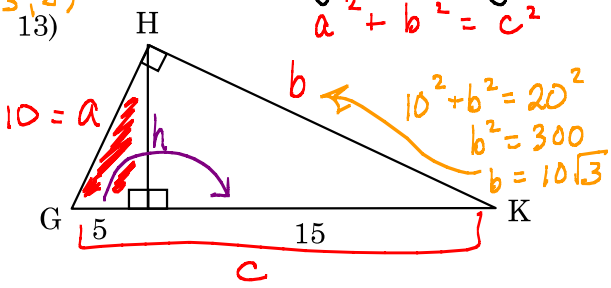
For 7-9 find the length of each leg of right triangle GHK. (find GH and HK)

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)



$10(1,\sqrt{3},2)$

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

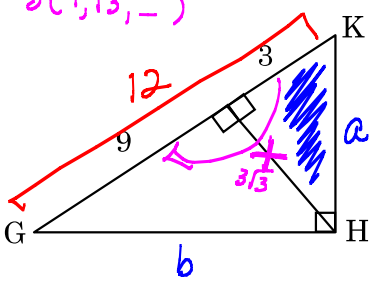
$b^2=300$

$b=10\sqrt{3}$

$\frac{5}{h}=\frac{h}{15}$, $h^2=5\cdot 5\cdot 3$, $h=5\sqrt{3}$

$5\sqrt{3}^2+5^2=a^2$, $75+25=a^2$, $a=10$

14)



$3(1,\sqrt{3},-)$

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

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

$9+27=a^2$

$36=a^2$

$6=a$

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

$b^2=144-36$

$b^2=108$

$b=6\sqrt{3}$

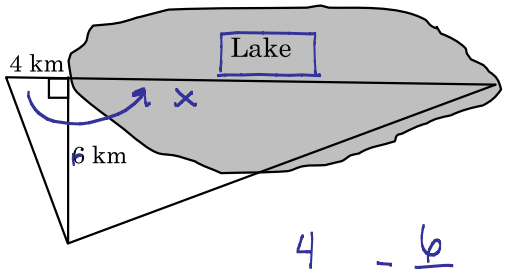
108

9 12

3 3 4 3

2 2

15) How far is it across the lake?



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

$4x=36$

$x=9$ km

The lake is 9 km long.