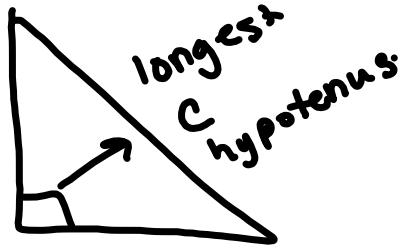
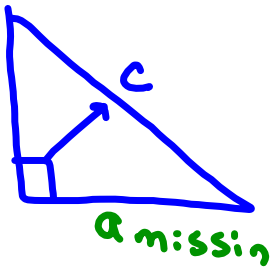


$c^2 = a^2 + b^2$



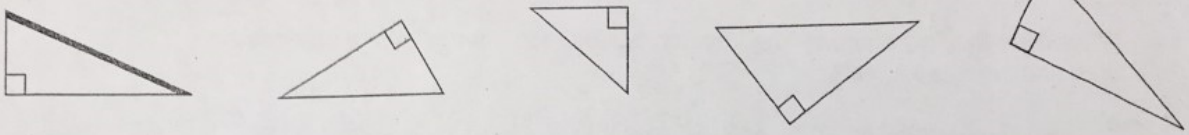
$a^2 = c^2 - b^2$

Nov. 25

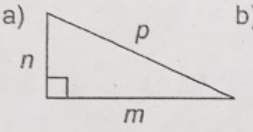
G8-4 The Pythagorean Theorem

Pythagorean Theorem
If a right triangle has sides a, b, c with c opposite the right angle, then $a^2 + b^2 = c^2$.

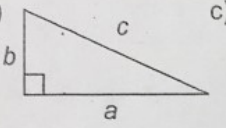
1. Trace the side c according to the Pythagorean Theorem.

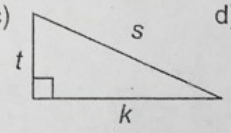


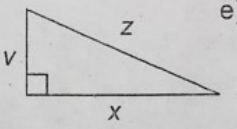
2. What does the Pythagorean Theorem say about each triangle?

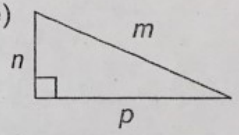
a) 

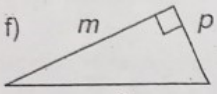
$n^2 + m^2 = p^2$

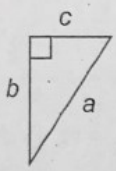
b) 

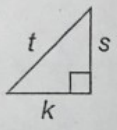
c) 

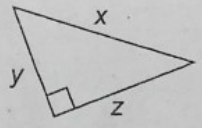
d) 

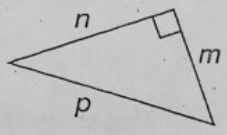
e) 

f) 

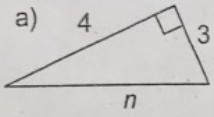
g) 

h) 

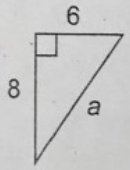
i) 

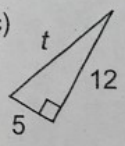
j) 

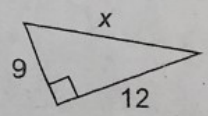
3. Use the Pythagorean Theorem to find the side opposite the right angle.

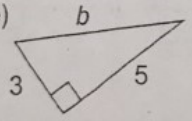
a) 

$n^2 = 4^2 + 3^2$
$= 16 + 9 = 25$
so $n = \sqrt{25} = 5$

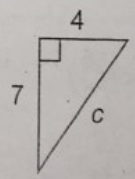
b) 

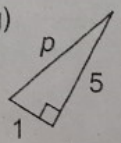
c) 

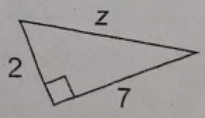
d) 

e) 

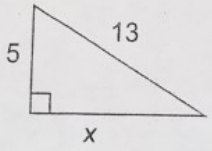
$b^2 = 5^2 + 3^2$
$= 25 + 9 = 34$
so $b = \sqrt{34}$

f) 

g) 

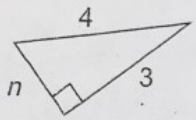
h) 

We can use the Pythagorean Theorem to find any side of a right triangle if two sides are given.

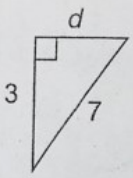


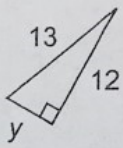
$5^2 + x^2 = 13^2$
$25 + x^2 = 169$
$x^2 = 169 - 25 = 144$
so $x = \sqrt{144} = 12$

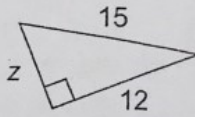
4. What does the Pythagorean Theorem say about each triangle? Write an equation, then find the missing side.

a) 

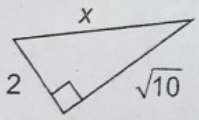
$n^2 + 3^2 = 4^2$
$n^2 + 9 = 16$
$n^2 = 16 - 9 = 7$
$n = \sqrt{7}$

b) 

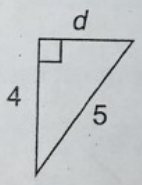
c) 

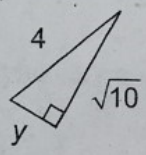
d) 

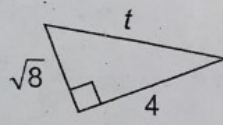
5. Find the missing side of the triangle using the Pythagorean Theorem. Then estimate the answer using a number line.

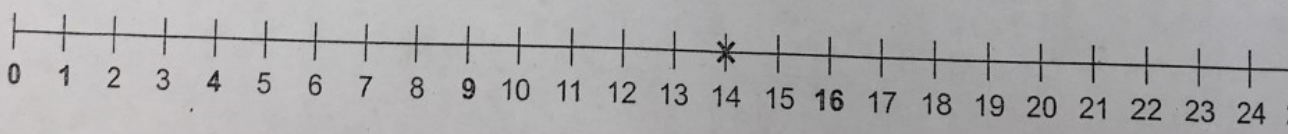
a) 

$2^2 + (\sqrt{10})^2 = x^2$
$4 + 10 = x^2$
$14 = x^2$
$x = \sqrt{14}$
$x \approx 3.7$

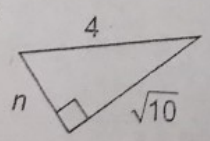
b) 

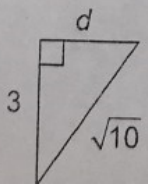
c) 

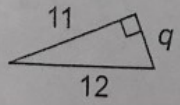
d) 



6. Find the missing side of the triangle.

a) 

b) 

c) 

d)