

Algebra I

Quiz Practice:

1.) Find the value of n such that each expression is a perfect square trinomial.

a.) $x^2 + 14x + n$

$$\frac{b}{2} = \frac{14}{2} = 7^2 = 49$$

c.) $q^2 - 44q + n$

$$\frac{b}{2} = -\frac{44}{2} = (-22)^2 = 484$$

b.) $k^2 - 28k + n$

$$\frac{b}{2} = \frac{-28}{2} = (-14)^2 = 196$$

d.) $x^2 + 34x + n$

$$\frac{b}{2} = \frac{34}{2} = 17^2 = 289$$

2.) Solve each Quadratic by Completing the Square:

a.) $m^2 - 6m = 247$

$$m^2 - 6m + 9 = 247 + 9$$

$$(m-3)^2 = 256$$

$$m-3 = \pm 16$$

$$+3 \quad +3$$

$$m = 19, -13$$

c.) $x^2 - 14x + 16 = 0$

$$x^2 - 14x = -16$$

$$x^2 - 14x + 49 = -16 + 49$$

$$(x-7)^2 = 33$$

$$x-7 = \pm \sqrt{33} \Rightarrow x = 7 \pm \sqrt{33}$$

b.) $x^2 - 20x + 32 = 0$

$$x^2 - 20x = -32$$

$$x^2 - 20x + 100 = -32 + 100$$

$$(x-10)^2 = 68$$

$$x-10 = \pm \sqrt{68}$$

$$+10 \quad +10$$

$$x = 10 \pm 2\sqrt{17}$$

d.) $2x^2 + 14x + 6 = 41$

~~Handwritten scribbles and crossed-out work for problem d.)~~

3.) Convert each to Vertex Form/Standard Form.

a.) $y = x^2 - 6x + 4$

$$a = 1$$

$$h = x = \frac{-b}{2} = 3$$

$$k = y = (3)^2 - 6(3) + 4$$

$$= 9 - 18 + 4$$

$$= -5$$

$$y = 1(x-3)^2 - 5$$

b.) $y = -2(x-1)^2 + 6$

$$y = -2(x-1)(x-1) + 6$$

$$= -2(x^2 - 2x + 1) + 6$$

$$= -2x^2 + 4x - 2 + 6$$

$$y = -2x^2 + 4x + 4$$

c.) $y = 2x^2 - 12x + 3$

$a = 2$

$h = x = \frac{12}{2(2)} = 3$

$k = y = 2(3)^2 - 12(3) + 3$

$y = 2(x-3)^2 - 15$

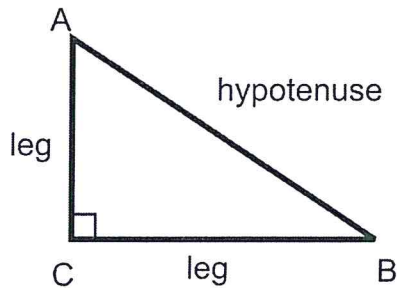
d.) $y = -5(x-2)^2 + 3$

$y = -5(x-2)(x-2) + 3$
 $= -5(x^2 - 4x + 4) + 3$
 $= -5x^2 + 20x - 20 + 3$

$y = -5x^2 + 20x - 17$

11.2 The Pythagorean Theorem

- In a right triangle, the side opposite of the right angle is the hypotenuse.
- It is the longest side. Each of the sides forming the right angle is a leg.



The Pythagorean Theorem describes the relationship of the lengths of the sides of a right triangle.

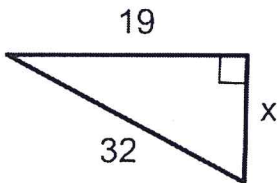
Pythagorean Theorem:

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

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

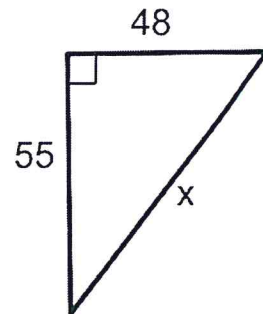
1. Find the lengths of the missing sides to the nearest tenth.

a)



$19^2 + x^2 = 32^2$
 $361 + x^2 = 1024$
 $x^2 = 663$
 $x = 25.7$

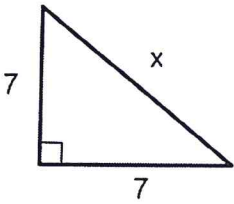
b)



$55^2 + 48^2 = x^2$
 $5329 = x^2$
 $73 = x$

2. Find the EXACT value of each missign side.

a)

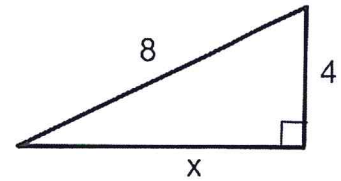


$$7^2 + 7^2 = x^2$$

$$49 + 49 = x^2$$

$$98 = x^2 \rightarrow x = \sqrt{98} < \frac{49}{2} \quad |x = 7\sqrt{2}|$$

b)



$$x^2 + 4^2 = 8^2$$

$$x^2 + 16 = 64$$

$$x^2 = 48$$

$$|x = 4\sqrt{3}|$$

3. The set of three numbers represents sides of a triangle. Does each form a right triangle?

a) 15, 20, 25

$$15^2 + 20^2 = 25^2$$

$$225 + 400 = 625$$

$$625 = 625 \checkmark$$

yes

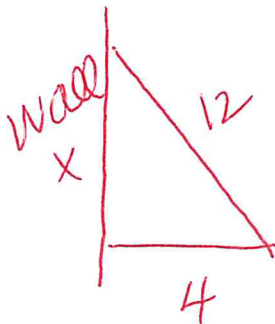
b) 14, 48, 51

$$14^2 + 48^2 = 51^2$$

$$2500 = 2601 \quad X$$

NO

4.) A 12 foot long ladder is placed against a wall so that the bottom of the ladder is 4 feet from the wall. How high up the wall can the ladder reach?



$$x^2 + 4^2 = 12^2$$

$$x^2 + 16 = 144$$

$$x^2 = 128$$

$$x = 11.3 \text{ ft}$$