Name _____ Period _____

5.2E *Solve Quadratic Equations Using Square Roots to Find Rational Solutions*

#1 – 6: Solve each equation using the square root property and check each answer.

1. $\sqrt{x^2} = \sqrt{4}$

$|x| = 2$

$x = \pm 2$

$(2)^2 = 4$ ✓

$(-2)^2 = 4$ ✓

✓Verify your solution(s):

$(2)^2 = 4$ ✓

$(-2)^2 = 4$ ✓

2. $2a^2 = 32$

$\sqrt{a^2} = \sqrt{16}$

$|a| = 4$

$a = \pm 4$

$2(4)^2 = 2(16) = 32$ ✓

$2(-4)^2 = 2(16) = 32$ ✓

✓ Verify your solution(s):

3. $3m^2 - 8 = 67$

$3m^2 = 75$

$\sqrt{m^2} = \sqrt{25}$

$|m| = 5$

$m = \pm 5$

$3(5)^2 - 8$

$75 - 8 = 67$ ✓

$3(-5)^2$

$75 - 8 = 67$ ✓

✓ Verify your solution(s):

4. $\sqrt{(x-1)^2} = \sqrt{36}$

$|x-1| = 6$

$x - 1 = 6$ or $x - 1 = -6$

$x = 7$ or $x = -5$

✓Verify your solution(s):

$(7-1)^2 = 36$

$6^2 = 36$ ✓

$(-5-1)^2 = 36$

$(-6)^2 = 36$ ✓

5. $(x+3)^2 - 16 = 0$

$\sqrt{(x+3)^2} = \sqrt{16}$

$|x+3| = 4$

$x + 3 = 4$ or $x + 3 = -4$

$x = 1$ or $x = -7$

✓ Verify your solution(s):

$(1+3)^2 - 16 = 0$

$4^2 - 16 =$

$16 - 16$

$0 = 0$ ✓

$(-7+3)^2 - 16 = 0$

$(-4)^2 - 16 = 0$

$16 - 16 = 0$ ✓

6. $2(x-2)^2 + 3 = 21$

$2(x-2)^2 = 18$

$(x-2)^2 = 9$

$\sqrt{(x-2)^2} = \sqrt{9}$

$|x-2| = 3$

$x - 2 = 3$ or $x - 2 = -3$

$x = 5$ or $x = -1$

✓ Verify your solution(s):

$2(5-2)^2 + 3 = 21$

$2(3)^2 + 3$

$18 + 3 = 21$ ✓

$2(-1-2)^2 + 3 = 21$

$2(-3)^2 + 3$

$18 + 3 = 21$ ✓

Name _____ Period _____

5.2E *Solve Quadratic Equations Using Square Roots to Find Rational Solutions*

7. A physics teacher drops an object from an initial height of 64 feet. The height of the ball (in feet) h at time t (in seconds) can be modeled by the equation $h(t) = -16t^2 + 64$. How long does it take the ball to reach the ground?

$-16t^2+64=0$
$-16t^2 = -64$
$\sqrt{t^2} = \sqrt{4}$
$|t| = 2$
$t = 2$ seconds or $t = -2$ extraneous

$-16(2)^2+64=0$
$-16(4)$
$-64+64=0$ ✓

✓Verify your solution(s):
2 seconds

8. The stopping distance "d" (in meters) that a car needs to come to a complete stop when traveling at speed "x" (in km/h) can be modeled by the equation $d = 0.009(x+15)^2 + 3$. On a certain road, drivers cannot see a stop sign until they are approximately 20 meters away. What is the maximum speed that should be posted in order to allow cars enough room to stop in time? Round your answer to the nearest whole number and verify your solution.

$20 = 0.009(x+15)^2 + 3$
$\frac{17}{0.009} = \frac{0.009(x+15)^2}{0.009}$
$\sqrt{1888.\overline{8}} = \sqrt{(x+15)^2}$
$43.4613 = |x+15|$
$x+15 = 43.4613$ or $x+15 = -43.4613$
$x \approx 28$ $\quad x \approx -58$ extraneous

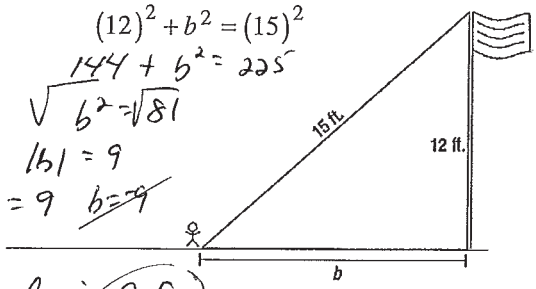
$.009(28+15)^2+3$
$(43)^2$
$(.009)1849+3 \approx 19.6 \approx 20$ ✓
28 Kmh

9. A missing leg of a right triangle can be found using the Pythagorean Theorem: $a^2+b^2=c^2$, where "a" and "b" are the legs of the triangle and "c" is the hypotenuse of the triangle (the side directly across from the right angle). Andy is trying to find the missing leg of the triangle below that represents the distance that the person is from a flagpole. The flag pole is 12 feet tall and he knows that the distance from the person to the top of the flagpole is 15 feet. Andy has started the problem by putting the values into the formula. Help him find the solution.

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

$(12)^2+b^2=(15)^2$

$144+b^2=225$
$\sqrt{b^2} = \sqrt{81}$
$|b| = 9$
$b = 9$ $\quad b = -9$



Other leg is 9 ft

Section 5.2E