Name:_____ Date:_____

Pre-Calculus 11 Ch3/4 HW Lesson 8: Solving Quadratic Equations by CTS

1. When solving the equation $9 = x^2$, how many solutions will there be? Explain:

2. When Solving the equation $12 = (x-3)^2$, how many solutions will there be? What are they?

3. What are we looking for on a graph when solving for "x"?

4. Suppose we solve for "x" and there is only one answer. What does this mean?

5. Solve each of the following equations algebraically:

a) $(x-3)^2 - 12 = 0$	b) $(2x+4)^2 - 16 = 0$	c) $-4(x+7)^2 + 14 = 0$
d) $0.5(x+11)^2 - 11 = 0$	e) $(x+5)^2 + 12 = 0$	f) $\frac{(2x+1)^2}{3} - 15 = 0$

g) $-\frac{2}{3}\left(x-\frac{3}{2}\right)^2+4=0$	h) $-\frac{7}{3}(2x-13)^2+15=0$	i) $\frac{17}{3}(2x-21)^2=0$

6. Solve each of the following quadratic equations by Completing the Square. Please show all your steps:

a) $0=3x^2+8x-5$	b) $0=4x^2+12x-11$
c) $4x^2=2-13x$	d) $0=-5x^2+10x-3$

7. The equation of a parabola is given by the equation: $y = 3x^2 + 5x - 10$. Find the roots [aka: coordinates of the x-intercepts] by completing the square:

8. A rocket is shot into the sky and the height of the rocket is given by the equation: $h(t) = -5t^2 + 12t + 10$ where "t" is the number of seconds after the rocket was launched.
   a. What is the height when the rocket hits the ground?

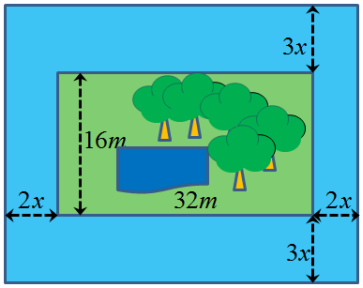
   b. At what time does the rocket hit the ground?

   c. After how many seconds will the rocket be at a height of 30meters?

9. The sum of an arithmetic series is given by the equation: $S = \frac{n}{2}\left(2 \times a + [n-1]d\right)$, where "n" is the number of terms, "a" is the first term, and "d" is the common difference. If the first term *"a"* is 10, common difference *"d"* is 4, and the sum *"S"* is 1144, find the number of terms *"n"* in the series.

10. On desmos, the formula for a perfect basketball shot is given by the formula: $h(x) = -0.05x^2 + 1.2x + 5.6$, where "h" is the height of the ball and "x" is the distance from the shooter. How far is the ball from the shooter when the height of the ball is 11feet high?
https://www.desmos.com/calculator/djikpphgde

11. A rectangular playground (16m by 32m) has a walkway around it as shown below. If adding the walkway doubles the area of the playground, find the value of "x":



12. Jason bought a 75" television at Costco. He knows that the screen aspect ratio is 16:9 [width to height]. Besides the screen, there is also a uniform border of 2" around. What is the width of the TV?