

# Algebra II Topics and Assignments

## Unit 2: Quadratic Functions

**Topic:** Graphing Quadratics- Standard form & Intercept (Factored) Form

**Assignment:** 2-1 p.253 #17, 19-25, 32-37, 39, 42, 45, 48, 54, 62, 64

**Topic:** Vertex Form

**Assignment:** 2-2 p.253 #26-31  
p.263 #108-135 (x3)

**Topic:** Solving Quadratics by Factoring

**Assignment:** 2-3 p.261 #65-85, 92-94

**Topic:** Solving Quadratics- Square Root Method

**Assignment:** 2-4 p.267 #1, 13, 15, 17, 18-72 (x3), 73, 74  
p.270 #1-6

**Topic:** Complex numbers (plot, add, subtract)

**Assignment:** 2-5 p.277 #15-45 (x3), 80-83, 95

**Topic:** Complex numbers (multiply, divide)

**Assignment:** 2-6 p.278 #49-54, 56-61, 92, 100

**Topic:** Completing the Square

**Assignment:** 2-7 p.287 #47-52, 55-58, 64-72 even, 85, 86  
p.270 Quiz 1 #7-11

**Topic:** Quadratic Formula & the Discriminant

**Assignment:** 2-8 p.295 # 4-12, 16, 47-55 odd, 65-67, 75, 78

**Topic:** Graphing Quadratic Inequalities

**Assignment:** 2-9 p.303 #14-22  
p.305 #54-69 (x3)  
p.317 #20-25

**Topic:** Review

**Assignment:** 2-10 p.314 #1-16, 18-20, 24-27  
p.317 #36  
p.318 #1-7, 9, 10  
p.289 #96-98

**Topic:** Unit 2 Test: Quadratics

**Assignment:** 2-11 p.941 #42-66 (x3)  
p.942 #30-45 (x3)

1. Give the vertex for the function:  $f(x) = -2(x+1)(x-3)$
2. Give the axis of symmetry for the function:  $f(x) = (x-2)^2 + 1$
3. Give the vertex for the function:  $y = 2x^2 - 8x + 1$
4. Give the roots for the function:  $y = x^2 - 25$

5. Solve by factoring:

$$2x^2 + 9x = -7$$

6. Solve by square roots:

$$-4x^2 = 360$$

7. Solve by square roots:

$$-\frac{1}{2}(x+1)^2 + 3 = 9$$

8. Solve by the Quadratic Formula:

$$x^2 - 6x - 7 = 8$$

9. Solve by Completing the Square:

$$x^2 - 2x = -5$$

Simplify each expression:

10.  $(8 + 2i) - (-2 - 7i)$

11.  $(3 + i)(2 - 5i)$

12.  $\frac{3i}{2 - i}$

# Applications of Quadratic Functions

## I. Vertical Motion

The height ( $h$ ) of an object  $t$  seconds after it is dropped can be modeled by:

$$h = -16t^2 + h_0$$

where  $h_0$  is the object's initial height.

Example 1: The Sears Tower in Chicago is 1,450 feet tall. How long would it take a penny to drop from the top of the Sears Tower to the ground below?

Example 2: A movie stunt man jumps from a window 50 feet above the ground. How long does it take for him to hit an air cushion 8 feet high?

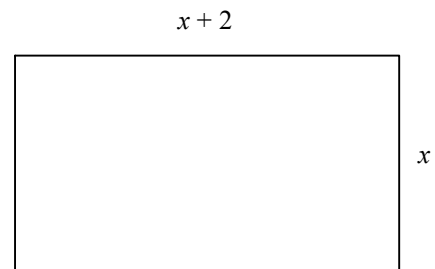
## II. Geometric Figures

Example 1: The rectangle below has the given dimensions and an area of  $10 \text{ cm}^2$ .  
Find the length and width of the rectangle.

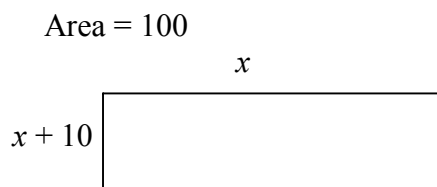


Example 2: Find the dimensions of the rectangle below.

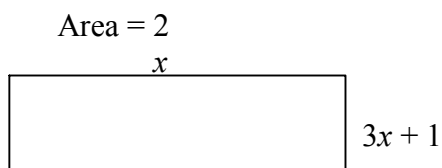
Area =  $6 \text{ cm}^2$



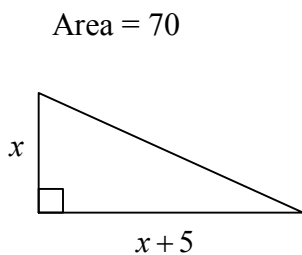
1. Solve for  $x$ .



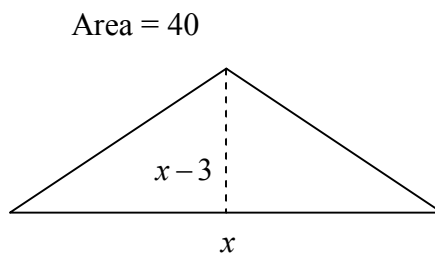
2. Solve for  $x$ .



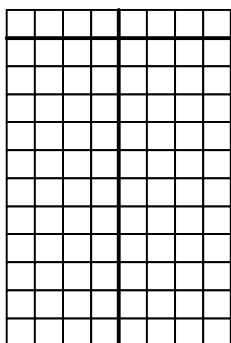
3. Solve for  $x$ .



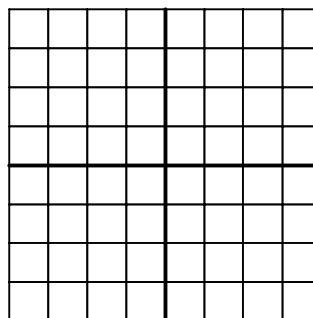
4. Solve for  $x$ .



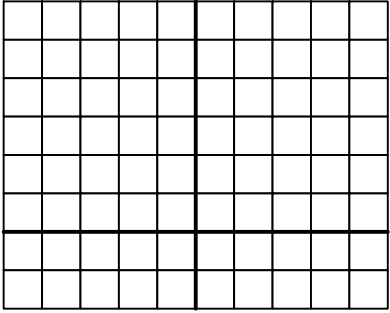
5. Graph  $y = -2x^2 + 8x - 5$



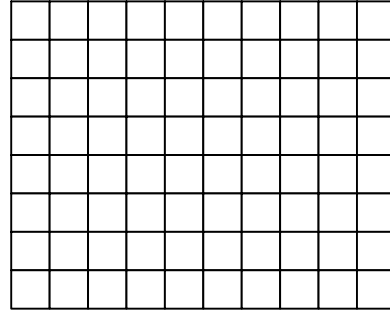
6. Graph  $y = -\frac{1}{3}(x+1)(x-5)$



7. Graph  $y = (x+3)^2 + 1$



8. Graph  $y < 2x^2 + 12x + 15$



9. Write in standard form

$$\frac{9+2i}{1-4i}$$

10. Solve by square rooting

$$7x^2 - 3 = 11$$

11. Solve by square rooting

$$3(p-9)^2 = 81$$

12. Solve by factoring

a.)  $3x^2 + 5x = 2x^2 - 6$

b)  $x^2 - 3x = 0$

13. Solve by completing the square

$$x^2 + 8x + 3 = 0$$

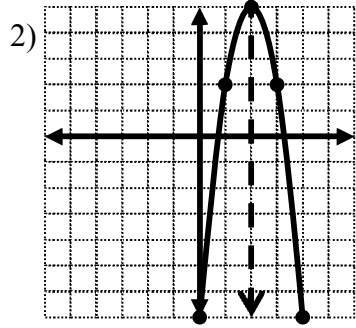
14. Solve by quadratic formula.

$$4x^2 + 28x = 15$$

15. A ball is dropped of a cliff that is 350ft tall. How long will it take the ball to hit the ground below? (recall:  $h = -16t^2 + h_0$ )

Unit 2 Review (Even Answers)

p314



aos:  $x = 2$       vertex:  $(2, 5)$

4)  $-8, -3$       6)  $-\frac{1}{2}, -1$

8)  $\frac{3}{5}$       10)  $\pm\sqrt{3}$

12)  $1 \pm 5\sqrt{2}$       14)  $-4 + 12i$

16)  $\frac{6}{5} + \frac{17}{5}i$       18)  $-2 \pm \sqrt{7}$

20)  $-\frac{1}{4} \pm \frac{\sqrt{57}}{4}$       24)  $4 \pm \sqrt{11}$       26)  $-\frac{5}{4} \pm \frac{\sqrt{3}}{4}i$

p317

36)  $t \approx 3.23$  seconds

p318

1) B    2) E    3) D    4) C    5) D    6) C    7) A    9) D    10) E

p289

96) C    97) B    98) A