

# Math I Unit 6 Study Guide

# Answer Key

Teacher: \_\_\_\_\_

Student Name: \_\_\_\_\_

OBJ. 1: Solving Quadratic Functions (Use any method)

1.  $x^2 + 6x + 8 = 0$

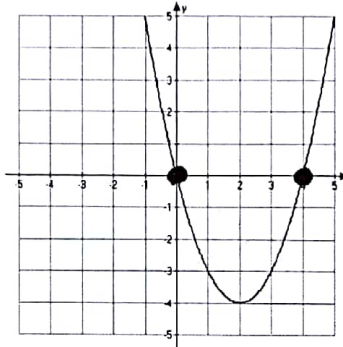
$(x+2)(x+4) = 0$

3.  $2x^2 + 10x + 9 = -2x^2 - 7x + 5$

$4x^2 + 17x + 4 = 0$   
 $(4x+1)(x+4) = 0$

4. What are the solutions (x-intercepts) to the graph at the right?

2.  $4x^2 = 100$   
 $\frac{4x^2}{4} = \frac{100}{4}$   
 $x^2 = 25$   
 $x = \pm 5$



OBJ. 2: Projectile Motion Application

5. The height of an object thrown into the air is given by the formula  $h(t) = -16t^2 + 80t$ , where  $h(t)$  is in feet and  $t$  is in seconds. What is the height of the object after 3 seconds?

$t = 3$   
 $-16(3)^2 + 80(3)$   
 $-144 + 240 = 96$

Use the following for 6-8: A ball is thrown into the air with an upward velocity of 64 ft/s. Its height  $h$  in feet after  $t$  seconds is given by the function  $h = -16t^2 + 64t + 80$ .

$x$  or  $t = ?$

$x = -b/2a$

$\frac{-64}{2(-16)} = \frac{-64}{-32} = 2$

6. In how many seconds will the ball reach its maximum height? Round to the nearest hundredth if necessary.

$+c$

$y_v$

plug in  $x_v$

7. What is the starting height? What is the ball's maximum height?

8. After how many seconds will the ball hit the ground?

X-factor

$2^{-4} x^{-12} y^{-8} 3^2 x^{10} y^4$   
 $\frac{9x^{10}y^4}{16x^3y^8} = \frac{9}{16}x^7y^{-4}$

$-16(t^2 - 4t - 5) = 0$   
 $(t-5)(t+1) = 0$   
 $t = 5$  or  $-1$

OBJ. 3: Review

9. Simplify:  $(2x^3y^2)^4(3x^5y^2)^2$

10. Given the volume of a rectangular prism:  $6x^3 + 4x^2 + 7x$ , find possible dimensions for the length, width and height.

$x(6x^2 + 4x + 7)$   
 $x(6x+1)(x+7)$

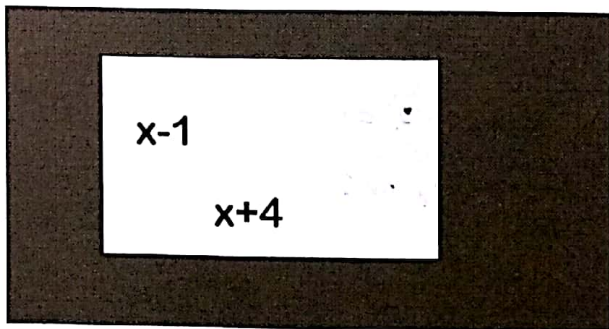
11. Find the sum of  $x$  and  $y$ , given:  
 $2x - 3y = 15$   
 $x + y = 5$

$2x - 3y = 15$

$5x = 30$

$x = 6 \quad y = -1$

12. Find the area of the shaded region.



$6x^2 + 17x + 5$   
 $-(x^2 + 3x - 4)$

Objective	Score
1	A B NY
2	A B NY
3	A B NY
4	A B NY
5	A B NY

ANSWERS:

- $x = \{-2, -4\}$
- $x = \{\pm 5\}$
- $x = \{-1/4, -4\}$
- $x = \{0, 4\}$

4/4 = 100	3/4 = 80	0-2 = NY
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5. 99 ft

6. 2 seconds

7. SH = 80ft MH = 144ft

8. 5 seconds

4/4 = 100	3/4 = 80	0-2 = NY
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9.  $\frac{9}{16}x^7y^{-4}$

10.  $x(6x+1)(x+7)$

11. 5      6 + (-1)

12.  $5x^2 + 14x + 9$

4/4 = 100	3/4 = 80	0-2 = NY
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13. A

14. D

15.  $x = \{-6, 2\}$

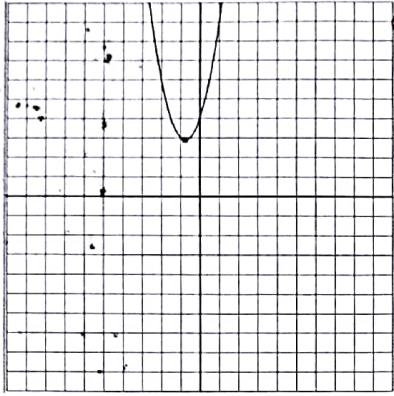
16. 85 ft

4/4 = 100	3/4 = 80	0-2 = NY
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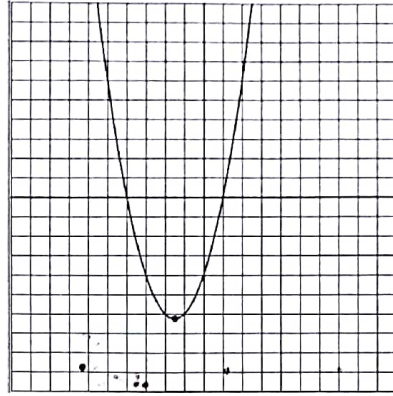
OBJ. 4: Quadratic Functions: Vertex and Axis of Symmetry

13. Which of the following is the graph of the function  $f(x) = 2x^2 + 3x + 4$ ?

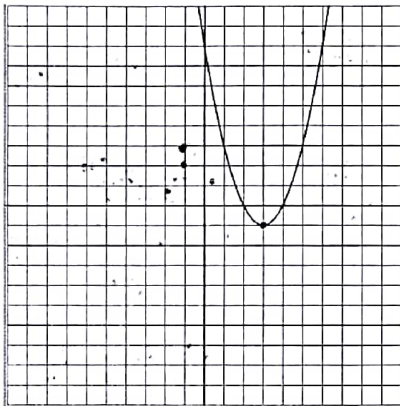
A.



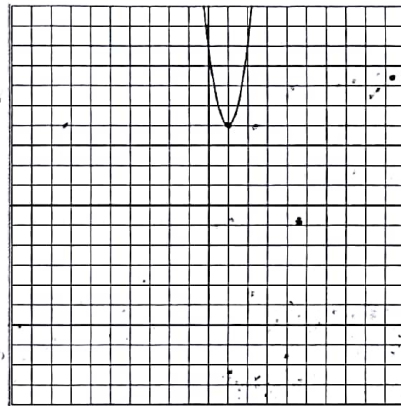
B.



C.



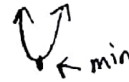
D.



14. Which best describes the graph of the equation  $f(x) = 2x^2 + 12x + 3$ ?

- a. Vertex is (3, 57), it opens up and has a minimum.
- b. Vertex is (3, 57), it opens down and has a minimum
- c. Vertex is (-3, -15), it opens down and has a maximum
- d. Vertex is (-3, -15), it opens up and has a minimum
- e. Vertex is (-3, -51), it opens up and has a maximum

$$x = \frac{-12}{2} = -3$$



15. What are the roots(solutions) of  $f(x) = x^2 + 4x - 12$ ?

$$(x+6)(x-2) = 0$$

$$x = -6 \text{ or } 2$$

16. The function  $h(t) = -6t^2 + 56t + 85$  models the approximate height of an object  $t$  seconds after it is launched.

What was the height of the object when it was launched?

starting height y-int "c"