



Algebra 2: Topic 2 Review Sheet

1. What is the equation in vertex form of a parabola with a vertex of (2, -6) that passes through (11, 21)?
2. Function g is a transformation of the parent function $f(x) = x^2$. The graph of g is a translation left 4 units and down 5 units of the graph of f . Write the equation for g in the form $y = ax^2 + bx + c$.
3. What is the vertex of the graph of the function $f(x) = x^2 - 12x$?
4. The path of a projectile launched from a 24-ft-tall tower. The function $s(t) = -16t^2 + 32t + 24$ gives the height of the ball, in feet, t seconds after it is launched. What is the maximum height, in feet, reached by the projectile? Also identify the vertex, x-intercept, and y-intercept.
5. Use quadratic regression to find a quadratic equation that fits the given points.

| | | | | | |
|---|------|--------|-------|-------|------|
| x | 1 | 2.3 | 6 | 5 | 0 |
| y | -1.3 | -8.528 | -88.3 | -58.1 | -3.1 |

6. Solve the equation $x^2 - x = 12$

7. A ball is thrown from the top row of seats in a stadium. The function $h(t) = -16t^2 + 64t + 2$ gives the height, in feet, of the ball t seconds after it is thrown. How long will it be before the ball hits the ground?

8. Identify the interval(s) on which the function $y = x^2 - 2x - 15$ is:

a. Negative

b. Positive

9. Use square roots to solve the equation $x^2 = -144$ over the complex numbers. Select all that apply.

a. -12

b. -12i

c. -12i²

d. 12i

10. Write in the form $a + bi$:

a. $6i(8 - 5i)$

b. $\frac{5}{3-i}$

c. $(7 + 2i)(7 - 2i)$

11. Find the factored form of the following expressions. Write an exact answer, using radicals and i as needed)

a) $x^2 + 49$

b) $4x^2 + 121$

12. Solve $0 = x^2 - 2x + 26$ by completing the square. Then solve again using the quadratic formula.

13. A function is defined by the equation $y = x^2 - 9x + 18$. Which of the statements are true? Select all that apply.

- Vertex is at $(9/2, -9/4)$
- The equation written in vertex form is $y = (x + 9/2)^2 - 9/4$
- The graph has a minimum at $y = -9/4$ at $x = 9/2$
- The domain is all real numbers
- The range is all real numbers

14. Solve using the Quadratic Formula:

a. $x^2 + 6x + 10.25 = 0$

b. Solve $x^2 - 8x + 13 = 0$

15. A model airplane is launched from a cannon on top of a platform. The equation $h(t) = -3t^2 + 18t + 13$ gives the height h , in meters, of the plane t seconds after it is launched.

a) What equation can be used to tell whether the ball reaches a height of 20 m?

b) Does the plane reach a height of 20 m?

16. What value(s) of b will cause $3x^2 + bx + c = 0$ to have one real solution?

17. Determine the number of real solutions of the system:

$$\begin{cases} y = x^2 - 4x + 7 \\ y = x + 3 \end{cases}$$

18. Solve the equation by writing a linear-quadratic system and solve using the intersection feature of a graphing

calculator. $2x^2 + 16x - 29 = \frac{1}{2}x - 5$ Write your answer as an integer or decimal rounded to two decimal places as needed. Use a comma to separate answers as needed.