



Name _____ Period _____ Date _____

NON-CALCULATOR SECTION

Vocabulary: Define each word and give an example.

1. Complex Number
2. Axis of Symmetry
3. Completing the Square

Short Answer:

4. Briefly describe the two methods for solving quadratic inequalities.
5. What is the discriminant of the quadratic equation $ax^2 + bx + c = 0$? Describe what it means if the discriminant is negative, positive, or zero.

Review:

6. Find the domain and range of $f(x) = x^2 - 5$.
7. Find the slope and y-intercept. $2x + 3y = 9$
8. Multiply: $(2x - 5)(x + 3)$

Problems:

****Be sure to show all work used to obtain your answer. Circle or box in the final answer.****

9. Find the discriminant and determine the number and types of solutions.

a. $3x^2 + 4x - 1 = 0$

b. $5x^2 = 6x - 3$



10. Solve the quadratic equations by **factoring**.

a. $2x^2 - 32 = 0$

b. $6x^2 - 11x + 4 = 0$

11. Solve the quadratic equation by **completing the square**: $2x^2 - 4x + 8 = 0$

12. Solve the quadratic equation by the **quadratic formula**:

a. $4x^2 + 2x = 5$

b. $2x^2 - 2x + 3 = 0$

13. Write $y = x^2 + 4x - 8$ in vertex form. Find the zeros and the vertex of the function.

14. Perform the following operations on complex numbers; write your final answer in standard form.

a. $(2 - i) + (-4 + 5i)$

b. $3i(4 - 2i)$

c. $(3 + 2i)(1 - 4i)$

d. $\frac{-2 - i}{i}$

e. $\frac{1 - 3i}{2 + i}$

f. $(4 - 5i)^2$

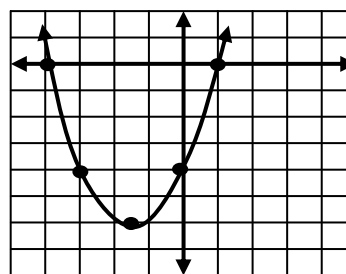


15. Given the graph of this quadratic function:

Find the vertex: _____

Axis of symmetry: _____

Identify the solutions: _____



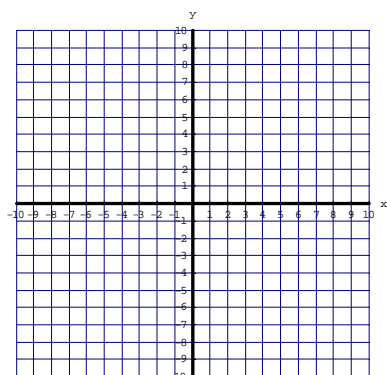
16. Determine how each quadratic equation differs from the parent quadratic function.

a. $g(x) = -\frac{3}{2}(x-4)^2$

b. $h(x) = 0.2(x+5)^2 - 3$

17. Graph the function and answer the questions below.

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



Vertex: _____

Max or min? _____

Direction of opening? _____

Wider or narrower than $y = x^2$? _____

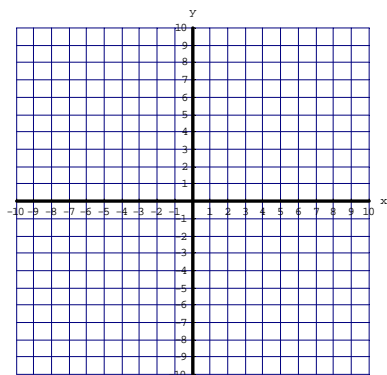
Domain: _____

Range: _____

Axis of symmetry: _____

18. Solve by graphing and answer the questions below.

$$f(x) = 3x^2 - 12x + 6$$



Vertex: _____

Max or min? _____

Direction of opening? _____

Wider or narrower than $y = x^2$? _____

Domain: _____

Range: _____

Axis of symmetry: _____



Multiple Choice Questions: **Circle the best answer.**

19. What are the solutions of the quadratic equation $3x^2 + 5x = -4$?

A. $x = \frac{-5+i\sqrt{23}}{6}, \frac{-5-i\sqrt{23}}{6}$

B. $x = \frac{5+i\sqrt{23}}{6}, \frac{5-i\sqrt{23}}{6}$

C. $x = \frac{-5+i\sqrt{73}}{6}, \frac{-5-i\sqrt{73}}{6}$

D. $x = \frac{5+i\sqrt{73}}{6}, \frac{5-i\sqrt{73}}{6}$

20. What is the equivalent equation of $x^2 - 6x + 2 = 0$ by completing the square?

A. $(x+3)^2 = 11$

B. $(x-3)^2 = 7$

C. $(x-3)^2 = 11$

D. $(x-6)^2 = -2$

21. Which equation below has only one solution?

A. $x^2 + 2x + 1 = -1$

B. $x^2 + 2x + 1 = 0$

C. $x^2 + 2x + 1 = 1$

D. $x^2 + 2x + 1 = 2$

22. The height of a triangle is 4 times greater than twice its base. The area of the triangle is 168 square inches. Which number is closest to the base length?

A. 7 in.

B. 8 in.

C. 9 in.

D. 10 in.



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CALCULATOR SECTION

1. A ball is thrown straight up with an initial velocity of 64 feet per second. The height of the ball at any given time can be modeled by $h = -16t^2 + 64t$, where t is time in seconds.
 - a. Find the time it will take the ball to reach its maximum height.

 - b. What is the maximum height of the ball?

 - c. How long is ball in the air?

2. If one leg of a right triangle is 7 meters shorter than the other leg and the hypotenuse is 13 meters, find the length of the two legs.

3. Solve the quadratic inequalities:
 - a. $4x^2 - 8x - 5 \geq 0$
 - b. $y < x^2 - 2x - 3$