LESSON 167 Review: Quadratic Equations and Functions

Try to complete as fast as you can. You may use a calculator unless otherwise specified.

1. Which statement is true?

A) All irrational numbers are real numbers.

B) All real numbers are irrational numbers.

C) The sum of irrational numbers is always an irrational number.

D) The product of irrational numbers is always an irrational number.

2. $i^3 + i^4 + i^5 + i^6$

Evaluate the expression above.

3. $(3 - i)(2 + 5i) + 4i$

Simplify the expression above. Write your answer in the form $a + bi$.

4. $(x - 1)(3x - 2) = 0$

What are the solutions to the equation above?

5. $3x^2 + 8x - 3 = 0$

If k is a solution to the equation above and $k < 0$, what is the value of $3k + 1$?

6. $2x^2 + 6x + 5 = 0$

If $a + bi$ and $a - bi$ are two solutions to the equation above, what is the value of $a + b$?

7. $3x^2 + 6x + k = 0$

For what values of k does the equation above have no real solutions?

8. $(x - 4)(2x + 3) = x - 7$

What is the sum of all values of x that satisfy the equation above?

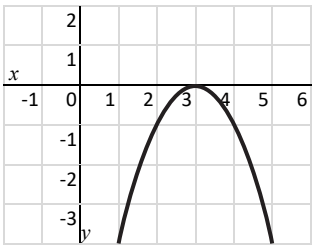
9. $3x^2 + bx + c = 0$

If the equation above has two solutions whose sum is 3 and whose product is 2, what are the values of b and c ?

10. The sum of two numbers is 7. The product of these numbers is 10. What are the numbers?

11. The area of a rectangle is 60 cm^2. Its width is three times its length. Find the dimensions of the rectangle in simplest radical form.

12. Which function is graphed below?



A) $y = x^2 - 3$ B) $y = -x^2 - 3$

C) $y = (x - 3)^2$ D) $y = -(x - 3)^2$

13. $f(x) = (x - 1)(x + 5)$

Which statement is true about the function above. Select all that apply.

A) The parabola opens upward.

B) The x-intercepts are -1 and 5.

C) The axis of symmetry is $x = -2$.

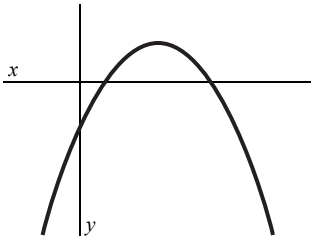
D) The vertex is $(-2, -9)$.

E) The y-intercept is 5.

14. $f(x) = x^2 + 6x - 1$

What is the vertex of the graph of the function above?

15. $f(x) = ax^2 + bx + c$ is graphed below. What are the signs of a, b, and c ?



16. $f(x) = 2x^2 + 4x + c$

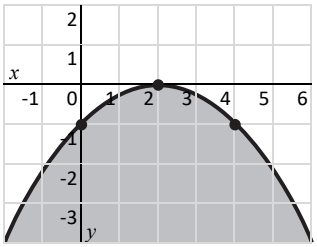
If the graph of the function above has one x-intercept, what is the value of c ?

17. $f(x) = kx^2 - 6x + 3$

For what values of k does the graph of the function above have no x-intercept?

18. The graph of $f(x) = x^2$ is reflected over the x-axis, and shifted right 1 unit and down 2 units to obtain the graph of $g(x)$. Write $g(x)$ in standard form.

19. Write the function graphed below in standard form.



20. $x^2 - x - 6 > 0$

Solve the quadratic inequality above.

21. A ball is thrown up from the ground with an initial speed of 80 feet per second. Its height h, in feet, after t seconds is given by $h(t) = -16t^2 + 80t$. How long will it take for the ball to hit the ground?