Name_____Test Study Guide/Practice Test 1-21-16

This is worth TEN assignments and is due by the end of class today!

NO WORK = NO CREDIT X = $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ D = $b^2 - 4ac$

There are several words that are interchangeable in mathematics in these sections

a. Roots
b. X intercepts
c. Solutions
d. Zeros

These words are the "answers" that we are looking for when we solve an equation, in particular when we are solving quadratic equations. So when a question asks you for the "root" of a quadratic equation, they are simply asking for the solution or the x intercept. Since we are setting an equation equal to 0, we can also say that we are looking for the zeros of a quadratic equation.

1. Find the zeros of the quadratic equation $x^2 - 12x = 2x + 32$

2. Find the roots of the quadratic equation $x^2 - 12x = 2x^2 + 52$

3. Find the solutions of the quadratic equation $3x^2 - 10x = 2x^2 - 32$

Parts of a Parabola

4. Given that you know that the x intercepts of a parabola are (12, 0) and (-2, 0) find the axis of symmetry

5. Given the quadratic function $y = 12 - 3x^2 - 10x$ find the vertex and axis of symmetry and y intercept

   a. Vertex as a point _____

   b. Axis of symmetry as an equation _____

   c. Y intercept as a point _____

6. Rewrite the following quadratic equation in standard form with a positive lead coefficient $-3x^2 - 7x = 8x^2 - 2$

   a. Standard form equation _____ a = _____ b = _____ c = _____

   b. What is the discriminant of this quadratic equation? _____

7. Simplify the expression completely
   $\sqrt{-32}$

8. Simplify the expression completely
   $\frac{-12 \pm \sqrt{-24}}{6}$

9. Simplify the expression completely
   $\frac{8 \pm 4\sqrt{5}}{10}$

Role of the discriminant

10. If you have _____ , then your quadratic equation will have 1 real solution
    a. D = 0
    b. D > 0
    c. D < 0

11. If you have _____ , then your quadratic equation will have 2 real solutions
    a. D = 0
    b. D > 0
    c. D < 0

12. If you have _____ , then your quadratic equation will have no real solutions
    a. D = 0
    b. D > 0
    c. D < 0

13. If you have _____ , then your quadratic equation will have 2 imaginary solutions
    a. D = 0
    b. D > 0
    c. D < 0

14. If your parabola "bounces" off the x axis, then you have _____
    a. D = 0
    b. D > 0
    c. D < 0

15. If your parabola crosses the x axis in two places , then you have _____
    a. D = 0
    b. D > 0
    c. D < 0

16. If your parabola NEVER crosses the x axis, then you have _____
    a. D = 0
    b. D > 0
    c. D < 0

17. Which of the following discriminants comes from a factorable quadratic equation?
    a. D =12
    b. D =-25
    c. D =17
    d. D = 49

18. Which of the following discriminants comes from a factorable quadratic equation?
    a. D =12
    b. D =-25
    c. D =0
    d. D = -64

Imaginary numbers

19. Which of the following is written in complex number form? a. 5i +6 b. 6 + 5i(5-i) c. -2 +6i d. $-2-7i^2$	20. Simplify i^{14}	21. Simplify i^{45}
22. Simplify (6 - 2i)(5+4i)	23. (6 - 2i)+(5+4i)	24. (6 - 2i)-(5+4i)

Imaginary Numbers continued

25. Simplify $\frac{5}{7+3i}$	26. State the first four powers of "i"	27. Simplify (6 - 2i)(6+2i)
28. Find the absolute value of $\lvert -2+7i \rvert$	29. State the conjugate of 9+5i	30. State the conjugate of 3i -9 (be careful)

Application

31. A rectangle has an area of 165, one side length is x and the other side length is x +7.2
    a. Write related quadratic equation in standard form

    b. Find the value of x

    c. Find the value of x +7.2