Test 2 Review: Mostly Intermediate Objective 3 & 4 with review topics from 1 &2

Intermediate Objectives: 3 & 4

- ✓ Definition of i, powers of i, operations on complex numbers
- ✓ Solve a quadratic equation by: factoring, square root property, completing the square and quadratic formula.
- ✓ Applications involving quadratic equations
- ✓ Solve equations that are quadratic in form including rational and negative exponents.
- ✓ Solve equations involving square roots.
- ✓ Solve a quadratic inequality and write answer in interval notation. Note special cases (always positive or always negative).
- ✓ Solve a rational inequality and write answer in interval notation.
- ✓ Solve absolute value inequality and write answer in interval notation. Note special cases (no solution, and all real numbers).

Note: Review the following practice problems in addition to test#1 Review, classwork (#1-10), class notes, handouts and ALEKS homework.

Solve each equation.

1. $6x^2 - 11x = 7$
2. $(3x+1)^2 = 8$
3. $3x^2 + 2x + 2 = 0$
4. $\sqrt{3x+4} + 4 = 2x$
5. $\sqrt{-2x+3} + \sqrt{x+3} = 3$
6. $x^4 - 17x^2 + 16 = 0$
7. $x^{\frac{2}{3}} - 9x^{\frac{1}{3}} + 8 = 0$
8. $x^{-2} - 2x^{-1} - 3 = 0$

Evaluate the discriminant for each equation, and then use it to predict the number and type of solutions.

9. $8x^2 = 2x - 6$
10. $16x^2 + 3 = 26x$

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Solve each inequality. Write answers in interval notation.

11. $2x^2 - x - 3 \geq 0$

12. $4x^2 + 2x + 1 \leq 0$

13. $9x^2 + 12x + 4 > 0$

14. $\frac{x+1}{x-3} \leq 5$

15. $\frac{3x+6}{x-5} > 0$

16. $|2x+1| \geq 11$

17. $|2x-5| < 9$

18. $|7x+8| - 2 > 1$

19. $|3x+7| < 0$

20. $|4x - 12| \geq -2$

21. $|7 - 2x| \leq -2$

22. Dimensions of a Picture Frame. Mitchel Levy went into a frame-it-yourself shop. He wanted a frame 3 in. longer than it was wide. The frame he chose extended 1.5 in beyond the picture on each side. Find the outside dimensions of the frame if the area of the unframed picture is 70 in^2.

23. Height of a Projectile. A projectile is fired straight up from ground level. After t seconds its height s, in feet above the ground, is given by

$$s = 220t - 16t^2$$

At what times is the projectile exactly 750 ft above the ground?