Name:_____ **Block:**_____

Math 11 Principles: Chapter 4 Review Assign:

1. **Section 4.1: Quadratic Formula & Solving Trinomials**: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
   a. The Q.F. is for finding the roots of a 2nd degree trinomial (Quadratic)

Q#1) Using the Quadratic Formula find the roots to 2 decimal places: (Hint: 2 answers each)

$a) 3x^2 - 4x + 1 = 0$ $b) 2x^2 + 6x - 3 = 7x^2 - 2x$

Answer:_____ Answer:_____

$c) 3a(2a - 6) = 8$ $d) 2(2x - 1)^2 + 9(2x - 1) + 7 = 0$

Answer:_____ Answer:_____

2. **Section 4.2: Nature of the Roots** $D = b^2 - 4ac$

Discriminant	Nature
$b^2 - 4ac > 0$	2 distinct roots (2 different roots)
$b^2 - 4ac = 0$	2 equal roots (Double root, 1 distinct root)
$b^2 - 4ac < 0$	No real roots (None)

Q#2) Using the discriminant, indicate the number of roots in each equation.

$a) 3x^2 - 4x + 1 = 0$ $b) 2x^2 + 6x - 8 = 7x^2 - 2x$

Answer:_____ Answer:_____

Q#3) For each of the following trinomials, determine what values of "k" will give the indicated number of solution. Draw a number line to illustrate your answer.

	2 Distinct Solutions	2 Equal Solutions	No Real Solutions
a) $4x^2 + kx + 6 = 0$			

b) $6x^2 - 10x + k = 0$			
c) $(2k+1)x^2 - 3x + 5 = 0$			
d) $(5k-1)x^2 - 4kx + 1 = 0$ (Hard)			

3. Section 4.3: Remainder Theorem:

The remainder theorem is a shortcut for finding the remainder when dividing a function $f(x)$ by a binomial $(x-k)$. All you need to do is substitute "k" for "x" into $f(x)$

Q#4)Use the remainder theorem to find the remainder when $f(x)$ is divided by the indicated binomial (Hint: Use Long Division/Synthetic Divsion to check your answer)

a) $f(x) = 3x^4 - 2x^3 + 6x^2 - 6x + 11 \quad \div \quad x - 5$

Answer:_____

b) $f(x) = 2x^3 + x^2 - 5 \quad \div \quad 2x - 1$

Answer:_____

c) $f(x) = 12x^3 + 6x^2 - 5x + 3 \quad \div \quad 2x - 3$

Answer:_____

Q#5) Using the remainder theorem, find the missing constant "c" with the given information:.

a) When $2x^3 - cx^2 + 5x - 11$ is divided by $x - 2$, the remainder is 13.

Answer:_____

b) When $27x^4 - 18x^3 + 4cx^2 - 6x + 2$ is divided by $3x - 2$, the remainder is $\frac{50}{3}$.

Answer:_____

4. Section 4.4: Factor Theorem:

The process to convert into Factored Form requires the following steps: (R.S.F.)

1. Use the **Remainder Theorem** to find the first root
2. Use the root obtained and **Synthetic Division** to divide $f(x)$ and find the quotient.

   This way, you break up the function into smaller parts
   ** (If the quotient has a higher degree than 2, then repeat steps 1 and 2, until the quotient is a trinomial)
3. **Factor** the quotient, using either the Q.F., BUM, or Criss-Cross Method.

Q#6) Use the factor theorem to factor each of the following functions:

a) $f(x) = 2x^3 - 3x^2 - 8x + 12$

Answer:_____

b) $f(x) = 2x^4 - 15x^3 + 36x^2 - 35x + 12$

Answer:_____

c) $f(x) = 20x^3 + 17x^2 - 40x + 12$

Answer:_____

5. Section 4.5 Solving Polynomial Inequalities:

Q#7) Solve each inequality and graph the solution on a number line:

a) $(x+1)(2x-1)(x-5)>0$

Answer:_____

b) $(x-2)(x-5)x^2 \geq 0$

Answer:_____

c) $6x^3-x^2-5x+2>0$

Answer:_____

d) $9x^3+39x^2+55x+25<0$

Answer:_____

6. Section 4.6: Solving Rational Inequalities:

Q#8) Solve each inequality and graph on a number line: (Express your answer as a radical if necessary)

a) $\frac{-4}{x+2}=x+7$

Answer:_____

b) $\frac{2}{x-2}=-2(x-5)$

Answer:_____

c) $\frac{2}{11-3x}>x-2$

Answer:_____

d) $\frac{x-4}{(x+1)(x-3)}+\frac{x-5}{(x-2)(x-3)}<\frac{2}{x+1}$ (Difficult)

Answer:_____

7. Section 4.7: Solving Radical Equations and Inequalities:

Q#9) Solve for x: (Keep your answers as a radical if possible)

$a)\sqrt{2x+5} = -2x+4$ $b)\sqrt{1-2x} = \frac{1}{2}x+3$

Answer:_____ Answer:_____

Solve each inequality and graph the solution on the number line.

$a)\sqrt{3x+5} > \sqrt{\frac{1}{2}x+3}$ $b)\sqrt{4-\frac{1}{2}x} < \sqrt{2x+3}$

Answer:_____ Answer:_____

8. Section 4.8: Solving Absolute-Value Equations and Inequalities:

Solve for x:

$a)\left|2x+1\right| = 3-x$ $b)\left|\frac{3}{2}x+3\right| = \frac{-3x-6}{2}$

Answer:_____ Answer:_____

Solve each inequality and graph the solution on the number line.

$a)\left|x-1\right| + \left|\frac{8-4x}{3}\right| < 8$ $b)\left|x+1\right| - 2 < -\left|x-3\right| + 2$

Answer:_____ Answer:_____