

Name \_\_\_\_\_

## Review Packet for Incoming Pre-Calculus Honors

### SHOW ALL WORK!

Find the degree and leading coefficient of the polynomial.

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

2.  $-3x^4 + 2x^2 - 5$

3.  $5$

Perform the indicated operations. Write the resulting polynomial in standard form.

1.  $-(5x^2 - 1) - (-3x^2 + 5)$

2.  $(x - 3 + y)(x - 3 - y)$

3.  $(2x^3 - 3)^2$

Factor each expression completely.

1.  $2x^3 - 6x$

2.  $(x - 1)^2 - 4$

3.  $9x^2 - 12x + 4$

4.  $4x^2 - 23x - 6$

5.  $9x^2 - 3x + 2$

6.  $5x^2 + 26x + 5$

7.  $9x^2 - 36$

8.  $16 + 6x - x^2$

9.  $2x^3 - x^2 - 6x + 3$

Given  $f(x) = -x^2 + 3$   $g(x) = 3x - 2$  Find and simplify each of the following:

1.  $f + g$

2.  $f - g$

3.  $f \cdot g$

4.  $f \circ g$

5.  $g \circ f$

6.  $f^{-1}(x)$

7.  $g^{-1}(x)$

8.  $f(g(2))$

9.  $g(f(-3))$

10.  $f/g$

Solve each quadratic equation **Three** ways:

(a) by factoring (when possible)

(b) by quadratic formula

(c) by completing the square

1.  $x^2 + 6x - 16 = 0$

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

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

Simplify each expression. Express each answer in standard radical form.

1.  $\sqrt{(54xy^4)}$

2.  $\sqrt[3]{(16x^5)}$

3.  $5\sqrt{x} - 3\sqrt{x} + 6\sqrt{y}$

4.  $2\sqrt{50} + 12\sqrt{8}$

5.  $(5 + 2\sqrt{3})(5 - 2\sqrt{3})$

6.  $(2 - \sqrt{3})(3 - \sqrt{6})$

Rationalize the denominator.

1.  $\frac{1}{2 + \sqrt{3}}$

2.  $\frac{5}{(2\sqrt{10}) - 5}$

3.  $\frac{2}{\sqrt{6}}$

Simplify each expression:

1.  $\frac{x+1}{(x-1)^2} + \frac{x-2}{x-1}$

2.  $\frac{2}{x+2} - \frac{6}{x-2}$

3.  $\frac{4x^2 + 20x}{9 - 6x - 3x^2} \div \frac{x+5}{x^2 - 9}$

4.  $\frac{6x}{3x-1} - \frac{4x}{2x+5}$

5.  $\frac{1}{1 + (1/a)} + \frac{1}{1 - (1/a)}$

Simplify each expression. Express all answers with positive exponents.

1.  $25x^8/10x^4$

2.  $(4/y)^3 (3/y)^2$

3.  $(4x)^{-2} (8x^4)$

4.  $(2x^5)^0$

5.  $(x^2 \cdot x^n) / (x^3 \cdot x^n)$

6.  $\frac{(64y^7)^{1/3}}{\sqrt[3]{(8y^2)}}$

7.  $(\sqrt[3]{162a^7b^3c^5})(54abc)^{-1/3}$

8.  $((2a^2b^4)/(3a^3b))^{-3}$

9.  $(25x^2y^4)^{-1/2}$

Solve each equation.

1.  $\frac{x-4}{x+2} + \frac{2}{x-2} = \frac{17}{x^2-4}$

2.  $\frac{x+3}{2x} = \frac{5}{8}$

3.  $\frac{x+2}{2x-3} + \frac{x-2}{x+1} = \frac{21}{2x^2-x-3}$

4.  $\frac{5}{x+2} + \frac{x}{2} = \frac{4}{3}$

Simplify each expression.

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

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

3.  $i^{101}$

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

Solve each System of equations **Three** ways:

(a) by Graphing

(b) by Substitution

(c) by Elimination

1.  $\begin{cases} y = 8 - x \\ \frac{1}{2}y - x = \frac{5}{2} \end{cases}$

2.  $\begin{cases} 2x - 3y = 3 \\ 4x + 2y = 14 \end{cases}$

Graph each equation. Identify the domain & range.

1.  $f(x) = \lfloor x \rfloor - 1$

2.  $f(x) = |x - 2|$

3.  $f(x) = \sqrt{-x}$

4.  $y = -3x^2 + 6x - 9$

5.  $f(x) = x + 3$  and  $f^{-1}(x)$

6.  $f(x) = \begin{cases} -2 & x < 0 \\ x + 1 & 0 \leq x \leq 10 \\ -\frac{1}{2}x + 16 & x > 10 \end{cases}$

Solve the equation:  $3 + \sqrt{x + 1} = 2x$

Graph  $y \leq 2x - 3$  on the coordinate plane.

Graph the solution to the system of inequalities:

$$y \leq -\frac{1}{3}x + 1$$

$$y \geq 0$$

$$x > 4$$