

Name: _____
 Honors Precalculus

Function Notation and Composition and Inverses

Directions: Find the value of each in the space provided, showing all steps. Circle your answer.

Given: $f(x) = 3x - 7$ $g(x) = x^2 + 3$

1. $f(-1)$

2. $f(x + 3)$

3. $f(f(x))$

4. $f(g(x))$

5. $g(f(x))$

6. $g(-2)$

7. $g(x + 2) - g(x)$

8. $f(g(2))$

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

Rational Expressions

Simplify the following expressions. State the restrictions

1. $\frac{x}{xy^2} - \frac{2x}{x^2}$

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

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

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

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Exponents

Directions: Simplify each in the space provided, showing all steps. Answers should have positive exponents. Circle your answer.

1. $a^{-2}b^3a^{-3}$

2. $\frac{4^{-5}4^6}{4^2}$

3. $\frac{14x^4y^3z^{-2}}{6y^8z^{-1}}$

4. $\left(\frac{5u^2v}{2u^2}\right)^2 \left(\frac{-3uv}{2u^2v}\right)^3$

5. $(36x^4)^{\frac{1}{2}}$

Factoring

Directions: Factor each of the following completely, circling your final answer.

a. $x^2 - 15x + 54$

b. $2x^2 + 5x + 3$

c. $16x^4 - 40x^2 + 25$

d. $4x^2 - 32x - 196$

e. $9x^2 - 16$

f. $225x^4 - 64y^8$

g. $27x^3 + 1$

h. $8a^3 - y^3$

i. $x^3 + 2x^2 - x - 2$

Solving Equations

a. $|5x + 6| = 16$

b. $2x^2 + 8x = 5$

c. $x^{\frac{2}{3}} = 16$

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

e. $\frac{3}{x-1} + \frac{2}{x+1} = \frac{8}{x^2-1}$

f. $x^4 - 6x^2 + 27 = 0$

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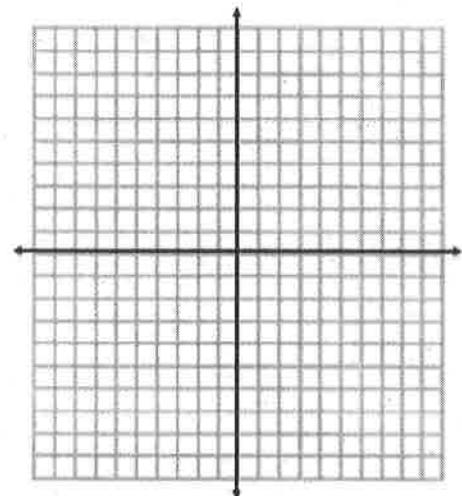
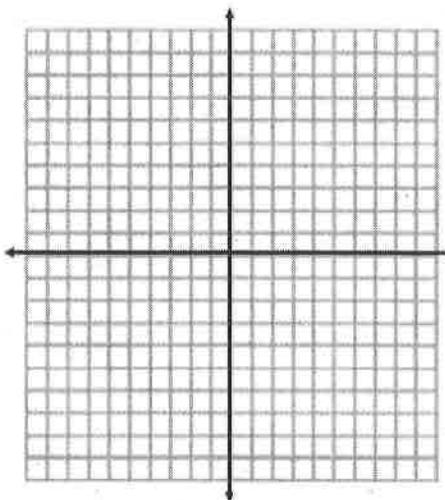
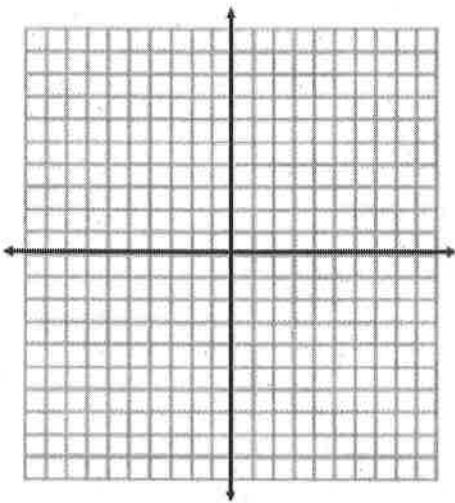
Basic Polynomial Graphs – Translations/Transformations of Parent Functions

Use the equation below to ACCURATELY sketch the graphs of the functions below without the aid of your calculator. Please label at least 3 points, including vertices, and also label any asymptotes, if applicable.

1. $y = |x - 3| + 2$

2. $y = \sqrt{x + 2}$

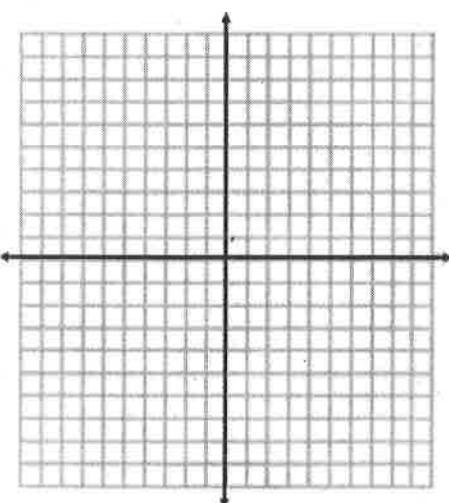
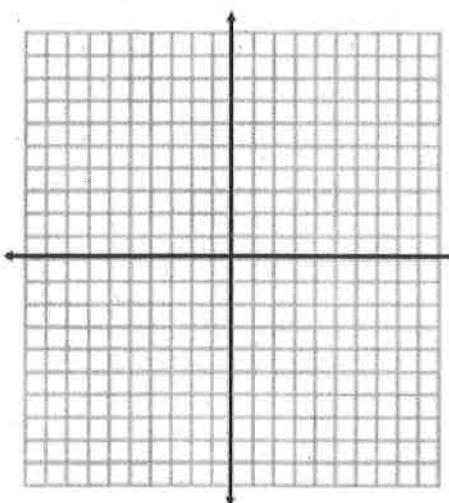
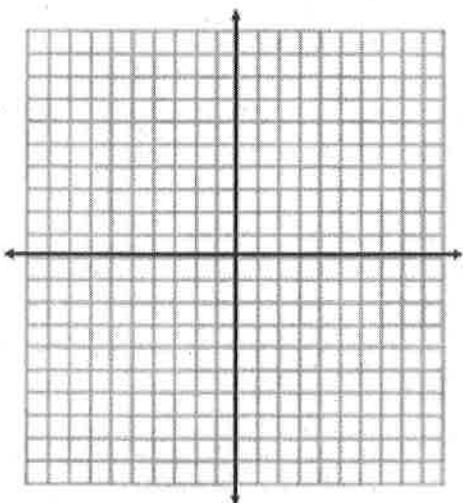
3. $y = \frac{1}{x+2} - 2$



4. $y = \frac{1}{2}x^2$

5. $y = 3(x - 1)^3$

6. $y = 2e^x$



Find the domain of each function:

a) $y = \sqrt{2x - 1}$

b) $y = \frac{3x-6}{2x+1}$

