

This assignment is designed to be completed **without a calculator** and showing all work. Completing this assignment will help prepare you to be successful in Precalculus.

Please note that calculators are not provided for student use in this class. Each student must have a graphing calculator (TI-84 or TI-84 plus recommended). The TI-89, TI-92 or comparable is not permitted.

Please use your notes from previous years, the internet, or work with other students. Also, you can email Mr. Cribbs at edcribbs@fcps.edu if you have any questions.

Precalculus will use some of the following symbols to represent certain number sets. You will not be tested on the following, but please be familiar with them.	
N	Natural Numbers
Z	Integers
Q	Rational Numbers
R	Real Numbers

1. Arrange the following subset of real numbers and arrange them in order from least to greatest.

$$\left\{ \sqrt{3}, -8, 2^5, 1, \frac{2}{3}, 3^{-2}, 0, -\frac{1}{7}, -\sqrt{5}, \pi, 9, i^2, 0.125 \right\}$$

2. Fill in the blank with $<$, $>$, or $=$.

a. $|-3| \square -|-3|$

b. $-5 \square -|5|$

c. $-(-2) \square -2$

3. Consider the expression $4x^3 - 6x^2 + 25x - 59$

a. How many terms does this expression have?

b. What is the constant term?

c. What degree is this polynomial?

4. Evaluate the following expression given $f(x) = \frac{x+1}{x-1}$.

a. $f(1) =$

b. $f(-1) =$

c. $f(5) =$

d. $f(-3) =$

e. $f(t) =$

f. $f(2x) =$

g. $f(x+3) =$

h. $f(-x) =$

5. Evaluate the following expressions.

a. -3^2

b. $3(-2)^4 - 4 \cdot 3$

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

d. $3 - 2i + 4 - \sqrt{-25}$

e. $(2i - 7)(4 + i)$

f. $7\sqrt{7} + \sqrt{63} + 2\sqrt{3}$

g. $\left(\frac{16}{81}\right)^{-3/4}$

h. $\frac{4 \cdot 3^{-2}}{2^{-2} \cdot 3^{-1}}$

i. $\frac{125 \cdot 9}{5^2 \cdot 3^5}$

j. $\sqrt[3]{\frac{27}{8}}$

6. Simplify the expressions.

a. $(-5z)^3$

b. $\frac{12(x+y)^3}{9(x+y)}$

c. $-\frac{2}{9}(3a^2b^{-1})^5$

d. $(2a^2 + b)^2$

e. $\left(\frac{x^{-3}y^4}{5}\right)^{-3}$

f. $\frac{18y^{4/3}z^{-1/3}}{24y^{-2/5}z}$

g. $(c^{3/2})^{1/3}$

h. $\frac{\frac{a}{8} - \frac{4}{a^2}}{4}$

i. $\frac{\sqrt{6} \cdot \sqrt{3w}}{\sqrt{w^3}}$

j. $\sqrt{54xy^4}$

k. $\sqrt[3]{16x^5}$

l. $2\sqrt{75x^2y^{-4}}$

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

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

o. $\frac{y^2 - 7y + 12}{y^2 + 3y - 18}$

p. $\frac{\left(\frac{x^2}{(x+1)^2}\right)}{\left(\frac{x}{(x+1)^3}\right)}$

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

r. $\frac{\frac{16}{m-3} - \frac{4}{m-4}}{\frac{16}{m^2} - \frac{4}{m-3}}$

7. Rationalize the denominator and simplify.

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

b. $\frac{\sqrt{3}}{\sqrt{5}}$

c. $\frac{1 - \sqrt{2}}{\sqrt{3}}$

d. $\frac{\sqrt{3} + 3\sqrt{14}}{\sqrt{2}}$

e. $\frac{3}{\sqrt{5} + \sqrt{6}}$

8. Find the product and write the result in standard form.

a. $(2x - 5y)^2$

b. $[(x - 3) + y]^2$

c. $\left(\frac{1}{2}x - 4\right)^3$

9. Factor completely the following expressions.

a. $9x^5 - 64x$

b. $3x^2 + 10x + 8$

c. $x^2 - 7xy - 8y^2$

d. $7x^2 + 22x + 3$

e. $15x^2 - 13xy + 2y^2$

f. $18 - 27x - 5x^2$

g. $x^8 + 7x^4 - 18$

h. $6x^2 + 8x + 2$

i. $30h^4 + 25h^2 - 30$

j. $x^3 + 64$

k. $x^3 - 6x^2 - 4x + 24$

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

10. Graph the following on the answer sheet of this packet.

a. $y = 2^{x+1} - 1$

b. $y = \log_4(x-2)$

c. $y = 2\sqrt[3]{x-2} + 1$

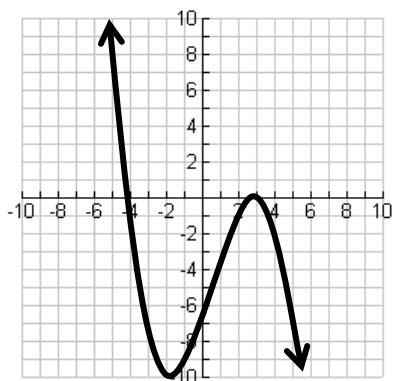
d. $y = \frac{1}{x+3} - 5$

e. $y = |x|$

f. Sketch $y = -x(x-2)(x-2)(x-4)$

with a horizontal shift of 2
and a vertical shift of -4

11 Fill in the information for the graph, problems a – n, on the answer sheet.



Answer Sheet

1. _____

2. a. _____ b. _____ c. _____

3. a. _____ b. _____ c. _____

4. a. _____ b. _____ c. _____ d. _____

e. _____ f. _____ g. _____ h. _____

5. a. _____ b. _____ c. _____ d. _____ e. _____

f. _____ g. _____ h. _____ i. _____ j. _____

6. a. _____ b. _____ c. _____

d. _____ e. _____ f. _____

g. _____ h. _____ i. _____

j. _____ k. _____ l. _____

m. _____ n. _____ o. _____

p. _____ q. _____ r. _____

7. a. _____ b. _____ c. _____

d. _____ e. _____

8. a. _____ b. _____ c. _____

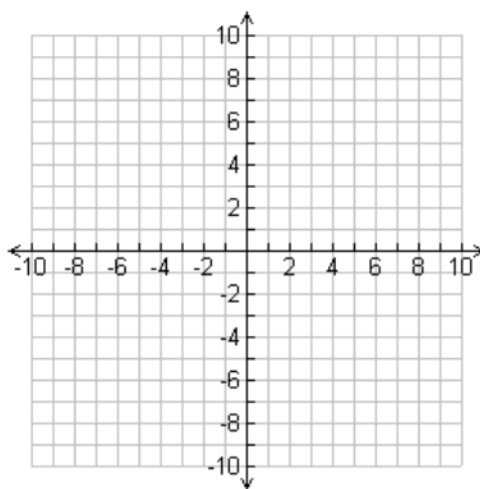
9. a. _____ b. _____ c. _____

a. _____ b. _____ c. _____

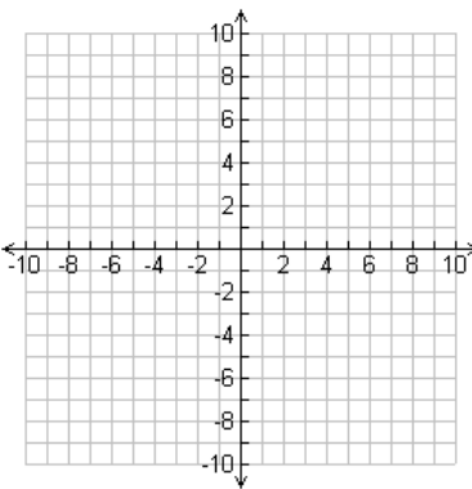
a. _____ b. _____ c. _____

a. _____ b. _____ c. _____

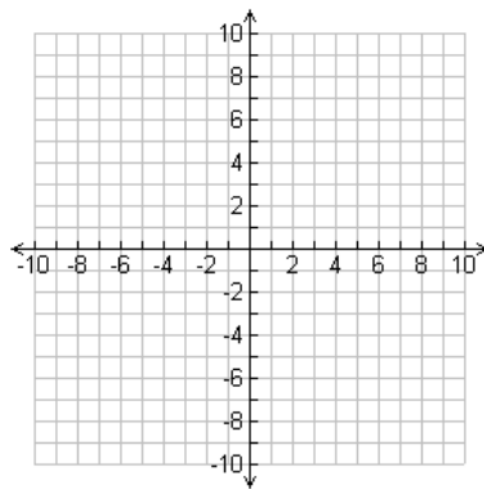
10. a.



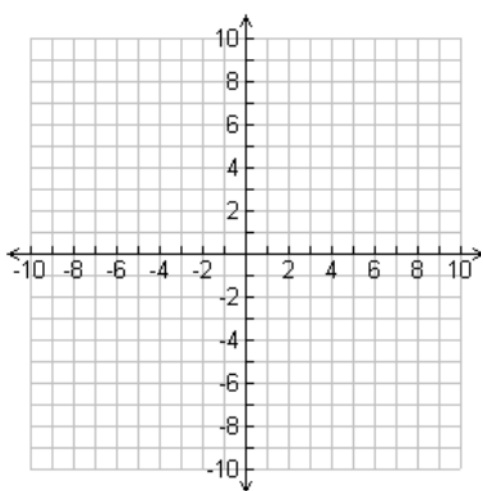
b.



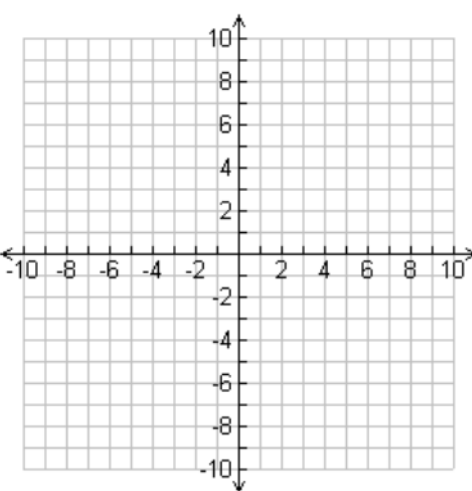
c.



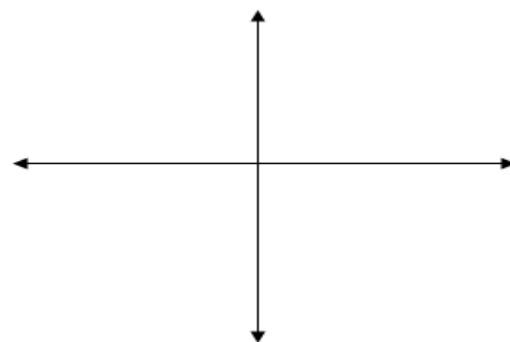
d.



e.



f.



11.

a. x-intercept(s) _____

b. y-intercept(s) _____

c. degree _____

d. name/type of polynomial _____

e. # of real solutions _____

f. # of imaginary solutions _____

g. maximum point(s) _____

h. minimum point(s) _____

i. increasing _____

j. decreasing _____

k. domain _____

l. range _____

m. As $x \rightarrow -\infty, f(x) \rightarrow ?$ _____

n. As $x \rightarrow \infty, f(x) \rightarrow ?$ _____