
We will be diving right in on the first day of school and recall of Algebra 2 and Geometry concepts will be vital. Do not confuse familiarity with mastery. You are encouraged to use your notes from previous years, the internet, or work with other students in order to complete this thoroughly and accurately. You should be able to do all these problems **without a calculator and showing all necessary work.**

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 Mrs. O'Neill at tioneill@fcps.edu if you have any questions.

1. Find each of the following giving exact answers (simple radical form – no decimals.)

a. The short leg of a $30^\circ - 60^\circ - 90^\circ$ triangle is 3 inches. Find the measure of the other two sides.

b. The leg of a $45^\circ - 45^\circ - 90^\circ$ triangle is 4 centimeters. Find the measures of the other two sides.

c. The long leg of a $30^\circ - 60^\circ - 90^\circ$ triangle is 3 inches. Find the measure of the other two sides.

d. The hypotenuse of a $45^\circ - 45^\circ - 90^\circ$ triangle is 4 centimeters. Find the measures of the other two sides.

2. 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. $f(-x)$

3. 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. $x^4(-2x)^3(6x^0)^{-2}$

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

4. State the domain of $f(x)$. Give the answer in interval notation.

a. $f(x) = \frac{x-2}{x+4}$

b. $f(x) = \sqrt{x^2 - 25}$

c. $f(x) = \frac{x^2 + 3x - 10}{x^2 - 25}$

5. Find $(f \circ g)x$ and $(g \circ f)x$. Then decide whether the functions are inverses of each other or not. Write yes or no.

a. $f(x) = \frac{x+5}{3}$, $g(x) = 3x - 5$

b. $f(x) = 2x^2 - 5x + 1$, $g(x) = 2x - 3$

6. State the inverse of each function. Tell whether the inverse is a function. Write yes or no.

a. $f(x) = 3x + 7$

b. $f(x) = x^5$

c. $f(x) = x^2 + 4$

7. Rationalize the denominator and simplify.

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

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

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

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. Solve each equation algebraically. Show clear, algebraic work.

a. $|1 - 4t| = 5$

b. $\sqrt{15 - 2x} = x$

c. $\frac{x+1}{3} + \frac{x+2}{7} = 5$

d. $2(x-3)^2 = 8$

e. $x^2 - 4x + 2 = 0$

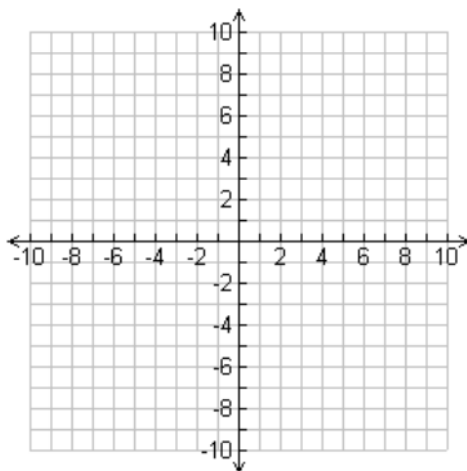
11. Solve each inequality algebraically. Use interval notation for the solution. Graph the solution set on a number line.

a. $|1 - 4x| \geq 5$

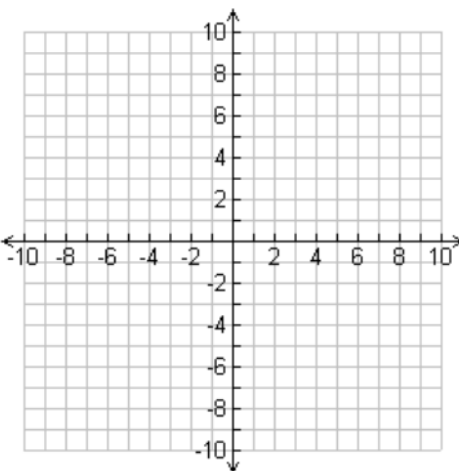
b. $x^2 + 3x - 4 < 0$

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

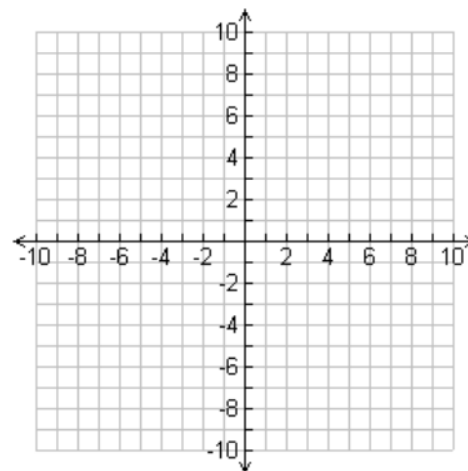
a. $y = 2^{x+1} - 1$



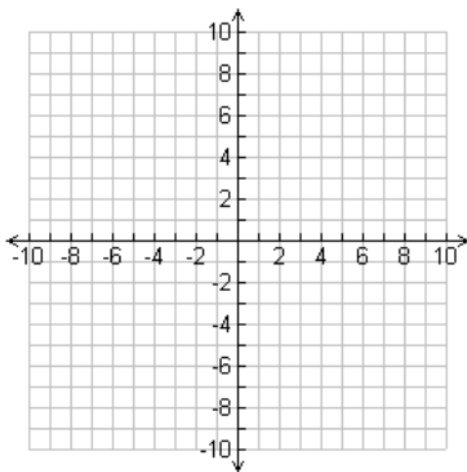
b. $y = \log_4(x-2)$



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

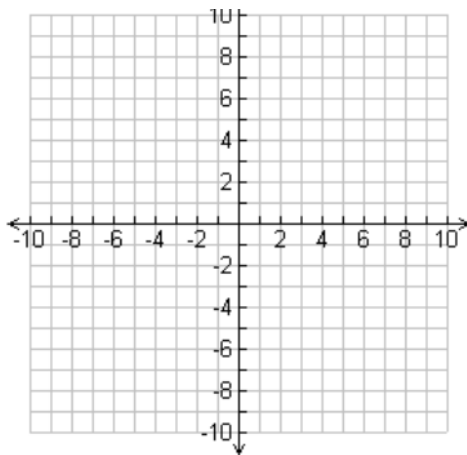


d. $y = \frac{1}{x+3} - 5$

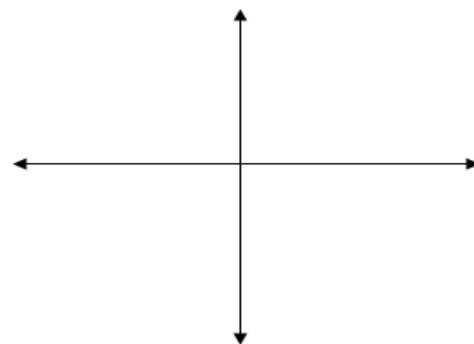


e. $y = |x|$

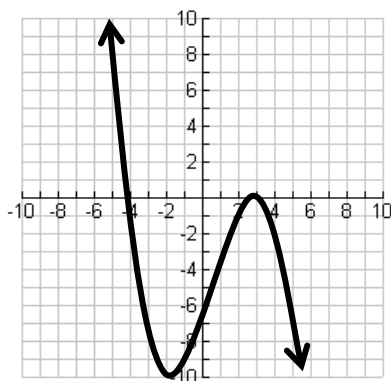
with a horizontal shift of 2
and a vertical shift of -4



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



13. Fill in the information for the graph.



a) x-intercept(s) _____ b) y-intercept _____

c) degree _____ d) name/type of polynomial _____

e) #of real solutions _____ f) # of imaginary solutions _____

g) local max(s) _____ h) local min(s) _____

i) decreasing _____ j) increasing _____

k) domain _____ l) range _____

m) left end behavior _____

n) right end behavior _____