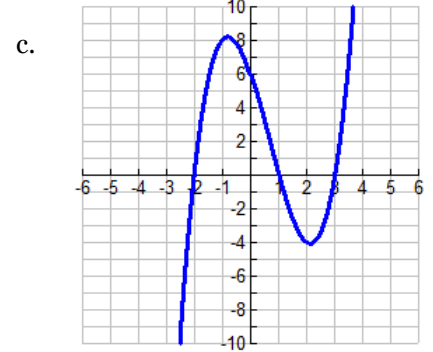
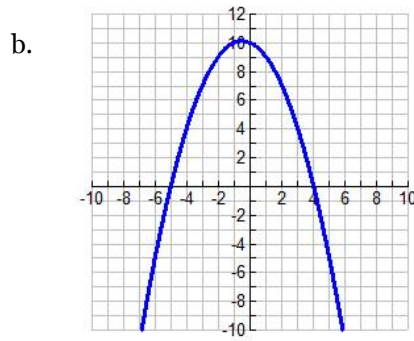
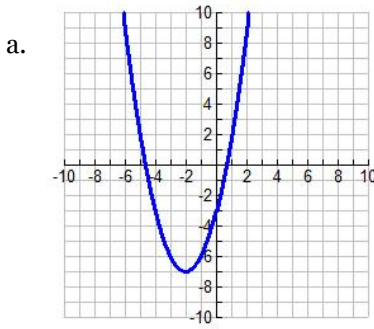


1. What is the, maximum, minimum, domain, and range of each graph below.



2. Simplify the following functions.

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

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

c. $\frac{7}{2x+1} - \frac{8x}{x-5}$

d. $\frac{5x}{x+2} + \frac{3}{x}$

3. Describe the transformations of the function from the parent graph of $f(x) = \frac{1}{x}$

a. $f(x) = \frac{1}{x-7} + 4$

b. $f(x) = \frac{4}{x}$

c. $f(x) = -\frac{1}{x+3}$

d. $f(x) = -\frac{3}{x+2} - 7$

4. Describe the end behavior of the following functions

a. $f(x) = 4(x+3)(x-5)$

b. $f(x) = x^2 + 7x + 12$

c. $f(x) = 3(x-5)^2 + 7$

5. Find the exact roots of the polynomial.

a. $x^3 - 7x^2 + 10x = 0$

b. $x^2 + 100 = 0$

c. $x^4 - 10x^2 + 9 = 0$

d. $x^2 - 121 = 0$

e. $x^3 + 9x = 0$

f. $x^2 + 18 = 0$

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

6. Write the polynomial equation of least degree for the roots given.

a. 1, 0, -5

b. $-2, \pm 4i$

c. double root at 8, $\pm 3i$, 0

7. Divide.

a. $(x^3 - 4x^2 + 5x - 11) \div (x - 1)$

b. $(2x^4 - 3x + 1) \div (x + 3)$

8. Find the remainder for each division. Is the divisor a factor of the polynomial?

a. $(x^3 - 4x^2 + 100) \div (x - 5)$

b. $(x^3 - 7x^2 - 16x + 112) \div (x - 4)$

R _____ Factor? _____

R _____ Factor? _____

9. Find all possible rational zeros of the function. Then determine all the zeros.

a. $f(x) = 8x^3 - 6x^2 - 23x + 6$

b. $f(x) = 2x^4 + 3x^3 - 8x^2 - 9x + 6$

Possible zeros: _____

Possible zeros: _____

Zeros: _____

Zeros: _____

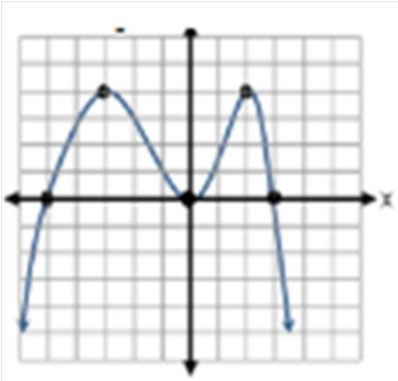
10. Graph the following functions and find the domain, range, and find the maximum or minimum.

a. $y = (x+4)^2 - 3$

b. $y = -3x^2 + 12x - 5$

c. $y = 2x^2 - 12x + 7$

11. Write an equation to the following graph. (Hint: use the x-intercepts to write the equation)



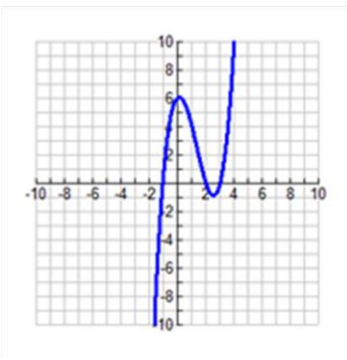
What are the x-intercepts? _____

Write your factors of the polynomial by using the x-intercepts. _____

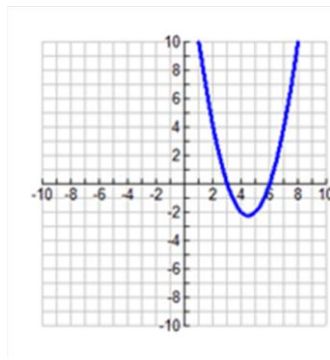
“FOIL” or Distribute your factors above _____

12. Find the zeros, end behavior, maximum(s), and minimum(s) for each graph below.

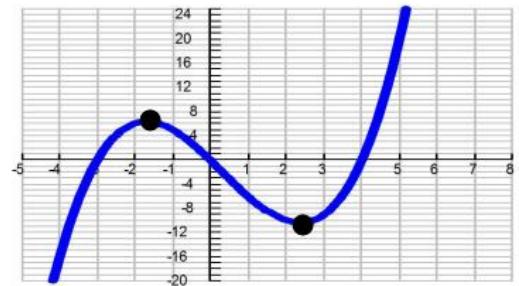
a.



b.



c.



13. Find the zeros

a. $y = 2x^2 - 12x + 7$

b. $y = x(x-2)(x+7)$

c. $y = 3x^3 + 21x^2 + 36x$

14. Graph the following functions and find the vertical asymptote(s), horizontal asymptote(s), and holes.

a. $y = \frac{x+3}{x^2 + 21x + 54}$

b. $y = \frac{x^2 - 6x + 3}{x^2 + 5x - 24}$

15. Simplify

$\frac{x+5}{3x} \div \frac{x-4}{x}$

$\frac{x^2 + 5x - 14}{x-1} \div \frac{x-2}{5}$

$\frac{3x+12}{3x} \cdot \frac{x+1}{x^2}$

16. Solve for the variable. Check your solutions and restrictions.

a. $\frac{2x}{3} + \frac{4x}{9} = \frac{1}{5}$

b. $\frac{x+3}{x+2} + \frac{4x}{x-5} = \frac{7}{x+2}$

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