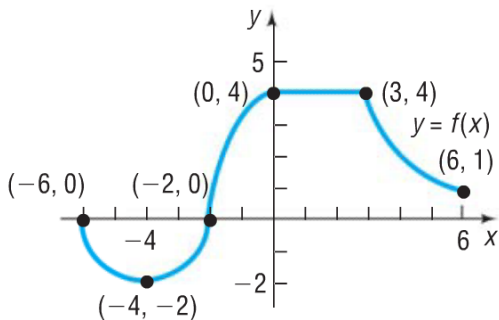


Name: \_\_\_\_\_ Period: \_\_\_\_\_

### SM2H Unit 1 – Unit 4 Cumulative Review

Use the graph to find the following information:

1.



Domain: \_\_\_\_\_ Range: \_\_\_\_\_

x-intercepts: \_\_\_\_\_ y-intercept: \_\_\_\_\_

Increasing: \_\_\_\_\_

Decreasing: \_\_\_\_\_

Constant: \_\_\_\_\_

Positive: \_\_\_\_\_

Negative: \_\_\_\_\_

Maximum/Minimum point(s): \_\_\_\_\_

Maximum/Minimum value(s): \_\_\_\_\_

2. Graph this function:  $f(x) = -\sqrt{x+4} - 6$

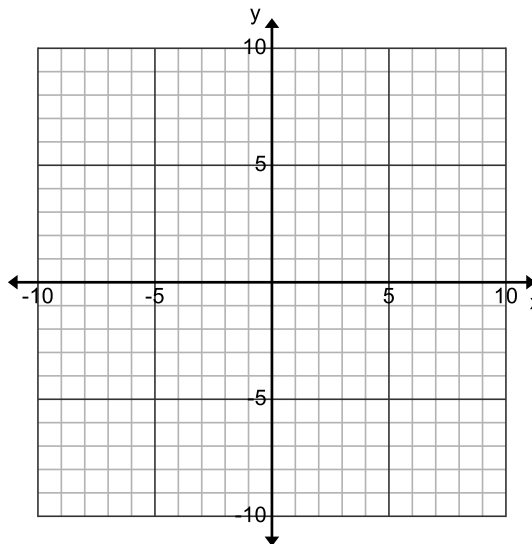
List Transformations in order here:

Tables:

Parent Graph

$$f(x) = \sqrt{x}$$

$x$	$f(x)$
0	
1	
4	
9	



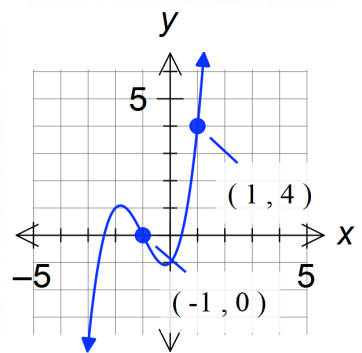
Endpoint: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Find the average rate of change for each function on the specified interval. Show your work!

3.  $f(x) = x^3 + 3x^2 + x - 1$ , on  $[-1, 1]$



Simplify the following expressions. Your answers should contain only positive exponents.

4.  $4a^{-3} \cdot 2a^2r^4$

5.  $\frac{18y^{-5}}{9y^2}$

6.  $(3x^{-3})^{-3}$

7.  $a^{\frac{1}{4}} \cdot a^{\frac{2}{3}}$

Simplify each radical expression.

8.  $3\sqrt{56x^5y^2}$

9.  $\sqrt[3]{40x^3y^8}$

10.  $\sqrt{-64}$

Rewrite the expression in radical form, then simplify if possible.

11.  $4^{\frac{5}{2}}$

Rewrite the expression using a rational exponent.

12.  $9\sqrt[3]{x^7}$

Add or subtract and simplify.

13.  $\sqrt{7} + \sqrt{28} - \sqrt{63}$

14.  $(5 - i) - (-6 + 12i)$

**Multiply and simplify.**

15.  $4\sqrt{3}(5 + \sqrt{6})$

16.  $\sqrt{-30} \cdot \sqrt{-100}$

17.  $7i(11 - 6i)$

18.  $(-6 - 2i)^2$

**Simplify.**

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

20.  $\frac{6 - 5i}{6 + 3i}$

**Simplify.**

21.  $(8w^2 + 8w) - (14w^2 + w)$

22.  $(6x + 6)(7x - 3)$

**Factor completely. Don't forget to factor out a GCF if there is one. If the leading coefficient is negative, factor out a negative GCF. If the polynomial is prime, say so.**

23.  $10x^2 - 5x$

24.  $x^2 + 6x + 14$

25.  $z^2 - 4$

26.  $4rt - 8r + t - 2$

27.  $w^2 + 3w - 10$

28.  $7t^2 + 15t - 4$

29.  $-10y^2 + 35y + 20$

30.  $49m^2 - 16$

31.  $m^2 - 6m + 9$

Find all solutions (real and imaginary) to each equation by taking square roots. Write all answers in simplest radical form and write complex answers in the form  $a + bi$ .

32.  $2k^2 - 3 = -21$

33.  $9(z - 3)^2 = 36$

Solve each equation by completing the square.

34.  $x^2 + 16x - 36 = 0$

35.  $x^2 + 16 = 10x$

Solve the equation using the quadratic formula.

36.  $x^2 - 5x - 24 = 0$

Fill in the requested information. Then graph the function. Plot at least 5 points.

37.  $f(x) = -(x+2)(x-4)$

Vertex: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

Direction of Opening: \_\_\_\_\_

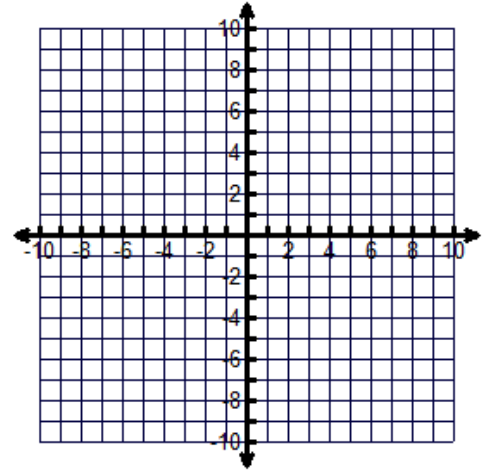
Is the vertex a maximum or a minimum? \_\_\_\_\_

What is the maximum/minimum value? \_\_\_\_\_

y-intercept: \_\_\_\_\_

zeros: \_\_\_\_\_

What are the x-intercepts? \_\_\_\_\_



38.  $f(x) = x^2 + 6x + 3$

Vertex: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

Direction of Opening: \_\_\_\_\_

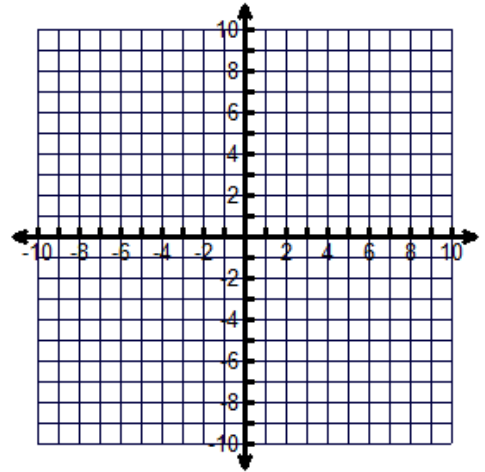
Is the vertex a maximum or a minimum? \_\_\_\_\_

What is the maximum/minimum value? \_\_\_\_\_

y-intercept: \_\_\_\_\_

zeros: \_\_\_\_\_

What are the x-intercepts? \_\_\_\_\_



39.  $f(x) = (x-1)^2 + 2$

Vertex: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

Direction of Opening: \_\_\_\_\_

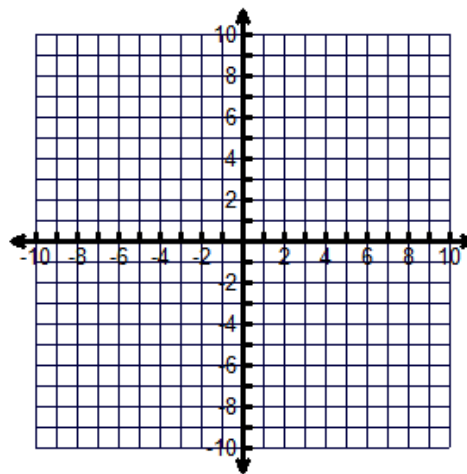
Is the vertex a maximum or a minimum? \_\_\_\_\_

What is the maximum/minimum value? \_\_\_\_\_

y-intercept: \_\_\_\_\_

zeros: \_\_\_\_\_

What are the x-intercepts? \_\_\_\_\_



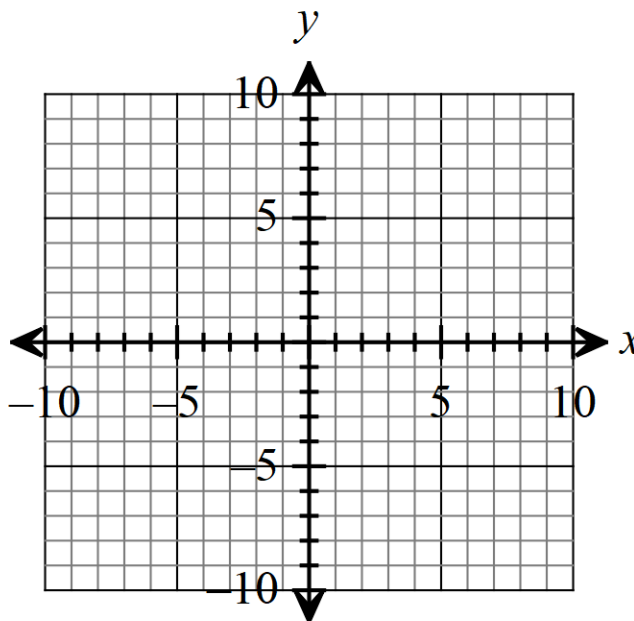
40. Write a quadratic equation in **vertex form** with vertex:  $(-12, -3)$  and passes through  $(-8, 21)$ .

**Solve each system of equations by graphing. Write the solutions as ordered pairs.**  
**NO GRAPHING CALCULATOR!!!**

41.

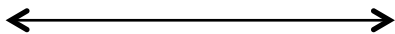
$x - y = 3$

$y = x^2 - 3$

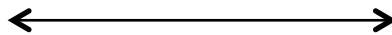


Solve the following inequalities. Write your answers in interval notation.  
NO GRAPHING CALCULATORS!!!

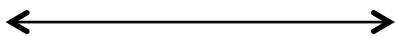
42.  $(x - 8)(x + 7) > 0$



43.  $-(x + 5)(x - 2) \geq 0$



44.  $x^2 - 10x \geq 0$



45.  $x^2 < 25$

