

Unit 2A Test Review

I. Fred Functions: The graph to the right shows $F(x)$:

1. List the characteristic points of
- $F(x)$
- .

$$(-6, 3) \quad (-4, -3) \quad (1, -3) \quad (3, 3)$$

2. What is the domain and range of
- $F(x)$
- ?

$$D: -6 \leq x \leq 3 \quad R: -3 \leq y \leq 3$$

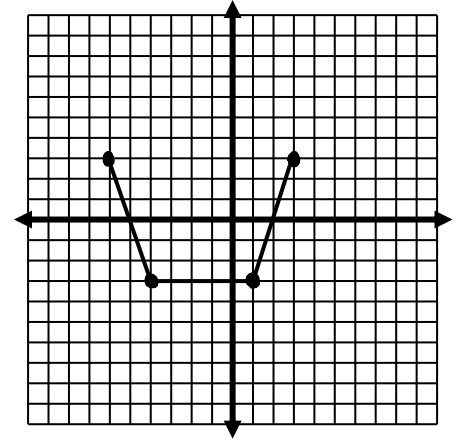
3. Graph the transformation
- $F(x+2) + 5$
- on the graph

- a. Describe the transformation in words.

shifted left 2 + up 5 units

- b. What is the new domain and range?

$$D: -8 \leq x \leq 1 \quad R: 2 \leq y \leq 8$$



Questions 4 -6. Assume the function $G(x)$ has a domain of $-2 \leq x \leq 6$ and a range of $-8 \leq y \leq 4$.

Describe in words ALL of the transformations that take place in the following and state the new domain and range.

4. $y = G(-x) - 4$

- a. Transformations: reflection over
- y
- axis + down 4 units

b. Domain: $-6 \leq x \leq 2$

c. Range: $-12 \leq y \leq 0$

5. $y = -\frac{1}{2}G(x)$

- a. Transformations: reflection over
- x
- axis + vertical shrink by
- $\frac{1}{2}$

b. Domain: $-2 \leq x \leq 4$

c. Range: $-2 \leq y \leq 6$

6. $y = 2G(x - 4) + 7$

- a. Transformations: vertical stretch by 2, right 4 + up 7 units

b. Domain: $2 \leq x \leq 10$

c. Range: $-9 \leq y \leq 1$

7. Write an expression for the function
- $H(x)$
- which is translated to the right by 2, translated up 5, reflected in the
- x
- axis and with a vertical shrink of
- $\frac{1}{3}$

$$-\frac{1}{3}H(x-2) + 5$$

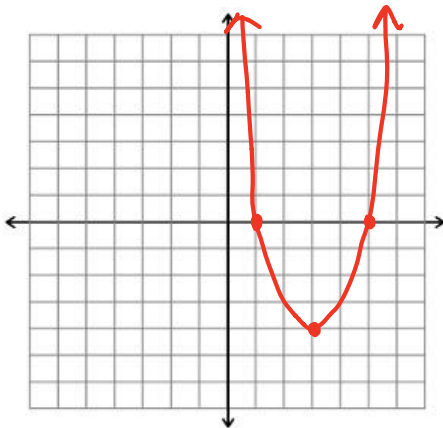
II. Adding/Subtracting/Multiplying Polynomials:

Simplify the following and put your final answer in standard form. Circle your final answer.

8) $8x^2 - 6x + 5 + 2x^2 + 3x - 7$ $6x^2 - 3x - 2$	9) $4x^2 - 7x + 2 - (6x^2 - 5x + 3)$ $-2x^2 - 2x - 1$
10) $(6x + 5)(7x - 2)$ $42x^2 + 23x - 10$	11) $(4x + 3)(3x^2 - 6x - 2)$ $12x^3 - 15x^2 - 26x - 6$

III. Characteristics of Quadratics: Graph and identify the characteristics of quadratics

12. $y = x^2 - 6x + 5$



Domain: $(-\infty, \infty)$

Range: $(-4, \infty)$

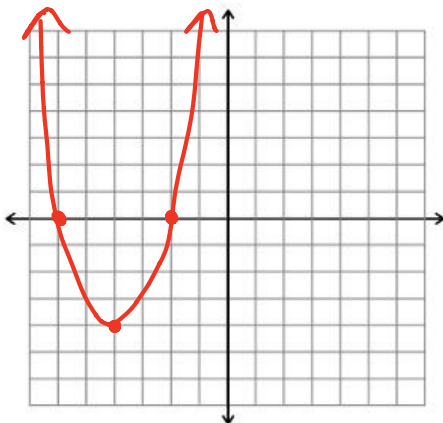
Axis of Symmetry: $x = 3$

Vertex: $(3, -4)$

y-intercept: $(0, 5)$

x-intercept(s): $(1, 0)$ $(5, 0)$

13. $y = (x + 6)(x + 2)$



Domain: $(-\infty, \infty)$

Range: $(-4, \infty)$

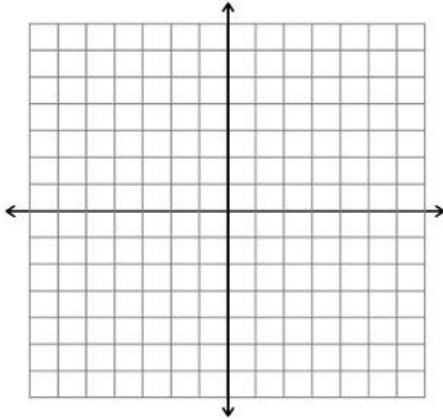
Axis of Symmetry: $x = -4$

Vertex: $(-4, -4)$

y-intercept: $(0, 12)$

x-intercept(s): $(-6, 0)$ $(-2, 0)$

$$14. y = -\frac{1}{3}(x - 1)^2 + 3$$



Domain: $(-\infty, \infty)$

Range: $(-\infty, 3]$

Axis of Symmetry: $x = 1$

Vertex: $(1, 3)$

y-intercept: $(0, 8/3)$

x-intercept(s): $(-2, 0) (4, 0)$

IV. Factoring: Factor Completely

(15) $4x^2 + 28x$

$$4x(x + 7)$$

(16) $8x^3 + 20x^2 + 6x + 15$

$$(4x^2 + 3)(3x + 5)$$

(17) $9x^2 - 25$

$$(3x + 5)(3x - 5)$$

(18) $x^2 + 13x + 36$

$$(x + 4)(x + 9)$$

(19) $x^2 + 11x - 42$

$$(x + 14)(x - 3)$$

(20) $x^2 - 12x + 36$

$$(x - 6)(x - 6)$$

$$\text{or}$$

$$(x - 6)^2$$

(21) $10x^2 - 11x - 6$

$$(2x - 3)(5x + 2)$$

(22) $5x^2 + 20x + 15$

$$5(x + 1)(x + 3)$$

~~V. Completing the Square: Complete the square and put in vertex form~~

~~(23) $y = x^2 - 4x + 9$~~

~~(24) $y = -3x^2 - 24x - 55$~~