# Unit 12 review

**Unit 12 Final Review**                                        Name_____

**Determine the new domain and range of $f(x)$ after applying the given transformation(s).**

**Domain: x < -2  Range: y > 3**

1)  $-f(x + 3) + 6$

Domain: $x < -5$

Range: $y < -3$

$\boxed{y < 3}$

2)  $f(x - 1) + 4$

Domain: $x < -1$

Range: $y > 7$

3)  $3f(x) - 12$

Domain: $x < -2$

Range: $y > 9$

$\boxed{y > -3}$

**Write the equation with the given information:**

4)  $f(x) = |x|$, reflected over the x-axis, vertically stretched by two, and is moved up seven units.

$$g(x) = -2|x| + 7$$

5)  $f(x) = \sqrt{x}$, shifted five units right, reflected over the x-axis, and shifted four units up.

$$g(x) = -\sqrt{x - 5} + 4$$

6)  $f(x) = 4^x$, vertically stretched by three, reflected over the x-axis, translated one unit right, down 4.

$$g(x) = -3\left(4\right)^{x-1} - 4$$

7)  $f(x) = x^2$, vertically compressed by two-fifths and translated right 5 and four units down..

$$g(x) = \frac{2}{5}(x - 5)^2 - 4$$

$$g(x) = \frac{2}{5}(x-5)^4 - 4$$

The following table represents $f(x)$.

$f(x) = $

| x | f(x) |
|----|------|
| -6 | 7 |
| -3 | 8 |
| 0 | 3 |
| 1 | -4 |
| 4 | 0 |
| 6 | -1 |

*(handwritten to the right: 21, 24, 9, -12, 0, -3)*

7) $f(x+2) - 5$

*(handwritten ←)*

| -8 | 2 |
|----|----|
| -5 | 3 |
| -2 | -2 |
| -1 | -9 |
| 2 | -5 |
| 4 | -6 |

8) $f(x-3) + 1$  *(handwritten →3 above)*

| -3 | -6 |
|----|----|
| 0 | -7 |
| 3 | -2 |
| 4 | 5 |
| 7 | 1 |
| 9 | 2 |

9) $3f(x) + 4$

| -6 | 25 |
|----|----|
| -3 | 28 |
| 0 | 13 |
| 1 | -8 |
| 4 | 4 |
| 6 | 1 |

11. The graph of $f$ is shown. Draw the graph of each function.
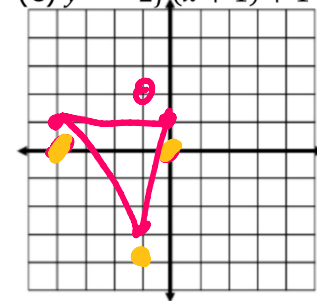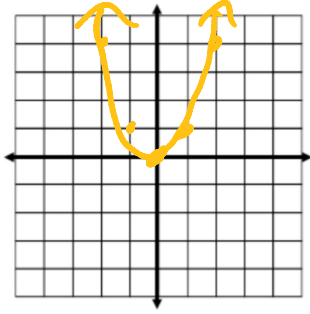
$f(x)$
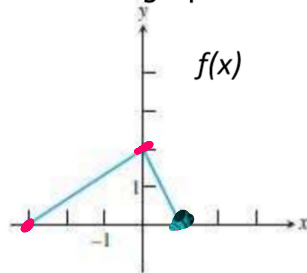
(a) $y = f(x - 2) - 3$
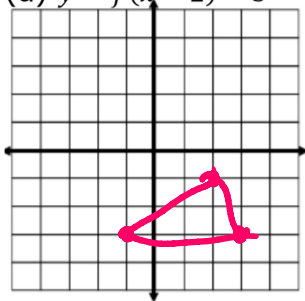
(b) $y = -f(x) + 2$
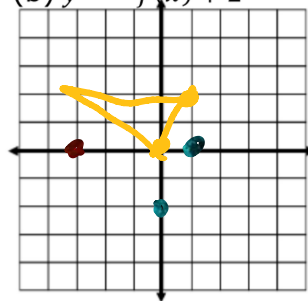
(c) $y = -2f(x + 1) + 1$

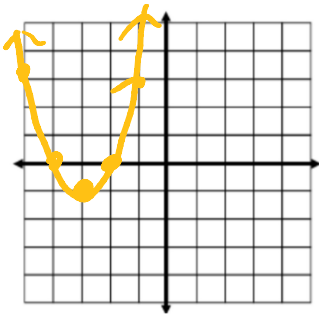12. Write an equation of a transformation of f(x) above where the x-intercepts do not change.

$$y = -f(x)$$

**13. Given a function $f(x) = x^2$, perform the following transformations.**
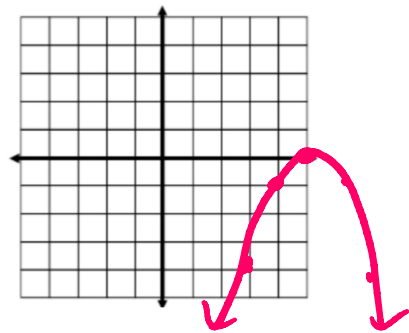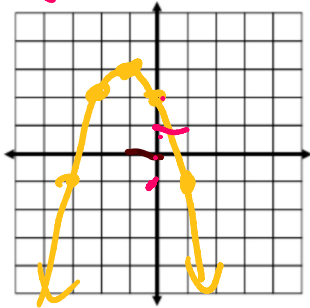
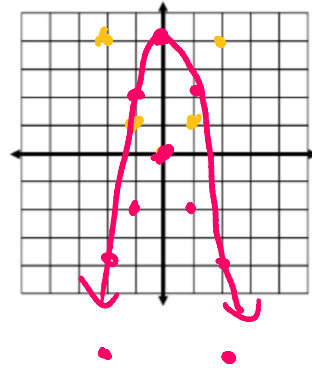a) shifted left three units and down one unit.          B) translated right five units and reflected over the *x*-axis.

c) $-f(x + 1) + 3$          d) $-2f(x) + 4$

e) $2f(x - 1) - 5$