

F1/E2: Demonstrate an understanding of functions, their representations, and their inverses, and make connections between the algebraic and graphical representations of functions using transformations

Content	Comm	Overall
44	Level	%

Name: _____
April 2015 PM

MCR3U Test 3

1. Given the following, state: [10]

$$\{(-3, 4), (-2, 7), (-1, 4)\}$$

$$y = \pm\sqrt{x-2}$$

Domain: _____

Domain: _____

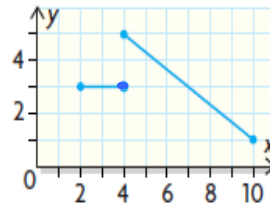
Range: _____

Range: _____

Function? _____

Function? _____

$$y = \frac{2}{x+3}$$



Domain: _____

Domain: _____

Range: _____

Range: _____

Function? _____

Function? _____

2. Given: $g(x) = \{(10, 5), (2, 10), (7, -3)\}$ and $h(x) = \frac{3x-1}{4}$, determine

- a) $h(-1)$ _____
- b) $g^{-1}(10)$ _____
- c) $2g(7)$ _____
- d) x such that $h(x) = 2$ _____

3. If the graph of $f(x) = x^3$ is stretched horizontally by a factor of 5, stretched vertically by a factor of 4, reflected in the y-axis and translated down 7 and left 8 units, state the new equation: [2]

4. Given the function $f(x) = -2(x-2)^2 + 2$,

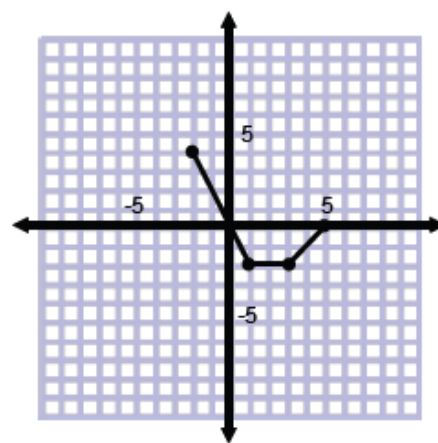
- a) What point(s) would be invariant between $f(x)$ and $-f(x)$? _____
- b) What point(s) would be invariant between $f(x)$ and $f^{-1}(x)$? _____

5. Given $f(x) = x^2 + 7x - 5$ and $g(x) = 4x - 3$, determine $f(g(x))$ [2]

6. Describe the effect(s) of $y = f(kx)$ can be obtained from the graph of $y = f(x)$. [2]

7. Given the graph of $f(x)$ below, Describe the transformations and sketch the graph of [4]

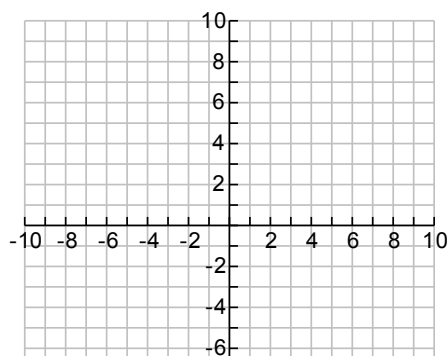
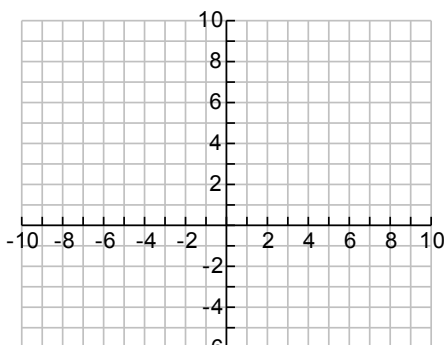
$$y = -\frac{1}{2}f\left(\frac{1}{2}x + 2\right) + 1.$$



8. Graph each of the following: [6]

i) $f(x) = 3(2)^{3-x} - 3$

ii) $g(x) = \frac{-1}{2x-6} + 4$



9. a) Determine the equation of the inverse for each of the following (State restrictions, if necessary) [5]

a) $f(x) = (x - 4)^2 - 3, x \leq 4$

b) $g(x) = \frac{1}{4 - x} + 8$

10. For each of the following, graph the function and its inverse. [6]

a) $f(x) = -\sqrt{x + 3} - 2$

b) $g(x) = -3\left|\frac{1}{2}x - 2\right| - 3$

