Name:_____ Date:_____

PRACTICE - MCR3U Test #1 Introduction to Functions

Knowledge	Application	TIPS	Communication
13	15	6	10

Part A: Knowledge and Understanding

Multiple Choice: Identify the choice that best completes the statement or answers the question. **[5]**

1. The domain of the function $y = \frac{1}{x^2}$ is:

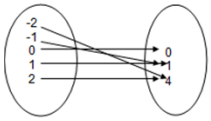
a) {x ∈ **R**} b) {x ∈ **R** | x ≠ 0} c) {x ∈ **R** | x ≠ 0, ±1} d) {y ∈ **R** | y ≠ 0}

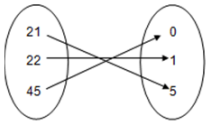
2. The vertex of the equation $y = -3\left(x - \frac{1}{2}\right)^2 + 2$ is:

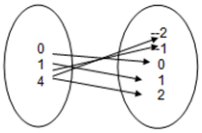
a) (-1/2, 2) b) (1/2, 2) c) (3, -1/2) d) (3, 2)

3. Which of the following relations is not a function?

a) b) c)







4. Which relation is not a function?

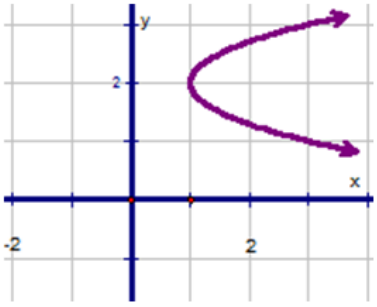
a) y = 3x – 7 b) $x^2 + y^2 = 36$ c) $y = -2(x - 3)^2 - 9$ d) y = x

5. Which of the following is the parent function for $y = 3\sqrt{x - 2} + 7$:

a) f(x) = x b) $f(x) = x^2$ c) $f(x) = |x|$ d) $f(x) = \sqrt{x}$

6. State which relations are functions. ***Explain.*** **[2]**

a) {(-2, 1), (-1, 2), (0, 4), (1, 1), (2, 2)} b)



7. Determine the domain and range of each relation **and** state whether the relation is a function. Explain your reasoning. **[6]**

a) $y = -2\sqrt{x-2} + 4$

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

Part B: Application

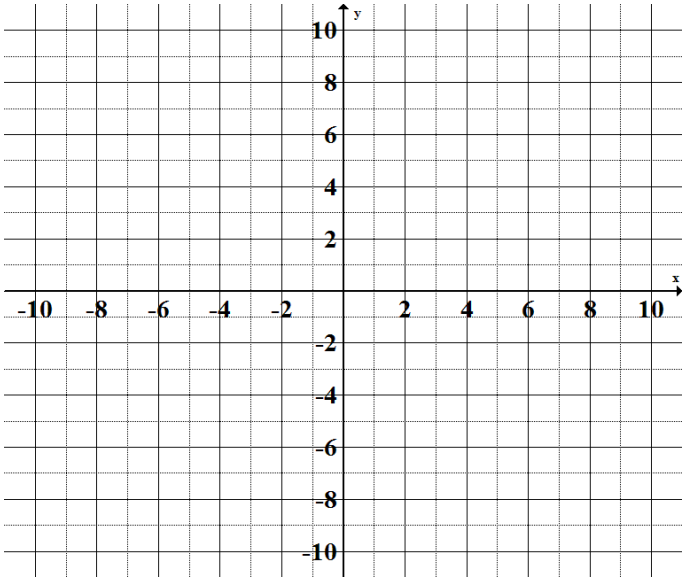
1. For $f(x) = x^2 + 2$ AND $g(x) = 8 - 7x$, evaluate: **[6]**

a) $g(-3a+1)$

b) $g(-3a+1) - f(a+4)$

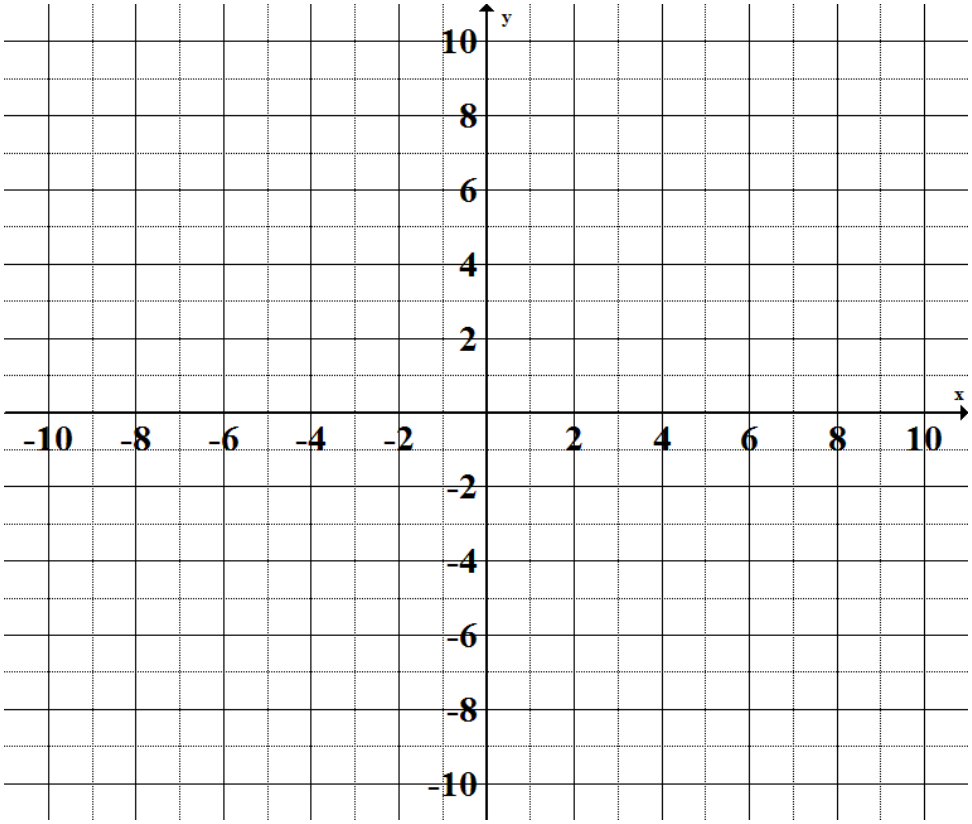
c) x when $g(x) = 5$

2. For the function $f(x) = \frac{3}{4}x + 2$, determine the inverse **<u>and</u>** sketch the graph of the function and its inverse. **[3]**



3. The function $y = f(x)$ has been transformed to $y = af[k(x - d)] + c$. Determine *a*, *k*, *c*, and *d*; write the equation; and sketch the graph of the transformed function. **[6]**

A horizontal compression by a factor of $\frac{1}{2}$, a reflection in the x-axis, a horizontal translation 3 units to the left and a vertical translation 2 units up are applied to $f(x) = \sqrt{x}$. Set up your table using x values 0, 1, 4, 9.



Part C: Thinking/Inquiry/Problem Solving

4. A farmer has 90 m of fencing to enclose a rectangular area and divide it into **two** sections as shown.

a) Write an equation to express the total area enclosed as a function of the width. **[2]**

b) Determine the domain and range of this area function. **[2]**

c) Determine the dimensions that give the maximum area. **[2]**

Part D: Communication

1. Explain how to determine the inverse of a function given: **[4]**
   a) An equation.

   b) A graph.

   c) A set of points.

2. Review your test and ensure that you have used proper communication. Your communication mark will be based on the following rubric: **[6]**

**** Please do NOT write on this rubric. ****

Criteria	Rating		
Proper use of mathematical terminology, equal signs, therefore statements, etc.	0 (never)	1 (sometimes)	2 (always)
Solutions are clear and well organized.	0 (never)	1 (sometimes)	2 (always)
Graphs are well labelled.	0 (never)	1 (sometimes)	2 (always)