Name Key Test 05 MR12H

You must show all work to receive full credit. **Please Circle your final answer.**

1. If $f(x) = (x^{-x} - x^0 + 2^x)$, then f(3) is equal to

$3^{-3} - 3^1 + 2^3$

$\frac{1}{3^3} - 1 + 8 = 7\frac{1}{27} = \frac{190}{27}$

2. If $f(x) = \frac{1}{\sqrt{2x-4}}$, the domain of $f(x)$ is

(1) $x = 2$ (3) $x \geq 2$

(2) $x < 2$ (4) $x > 2$

$\{x | x \in \mathbb{R}, x > 2\}$

$(\sqrt{2x-4} > 0)^2$

$2x - 4 > 0$

$2x > 4$

$x > 2$

3. Which set of ordered pairs is *not* a function?

(1) {(3,1), (2,1), (1,2), (3,2)}

(2) {(4,1), (5,1), (6,1), (7,1)}

(3) {(1,2), (3,4), (4,5), (5,6)}

(4) {(0,0), (1,1), (2,2), (3,3)}

4. What is the domain of the function :

$f(x) = \frac{1}{x^2 - 5x + 6}$

$\{x | x \in \mathbb{R}, x \neq 3, 2\}$

$x^2 - 5x + 6 = 0$

$(x-3)(x-2) = 0$

$x = 3, 2$

5. A function is defined by the equation $y = 5x - 5$. What is the inverse of this function?

$x = y$

$y = 5x - 5$

$x + 5 = 5y - 5 + 5$

$\frac{x+5}{5} = \frac{5y}{5}$

$y = \frac{x+5}{5}$

6. Which relation is *not* a function?

(1) $y = 2x + 4$ (2) $x = 3y - 2$

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

(7) If $f(x) = 5x^2$ and $g(x) = \sqrt{2x}$, what is the value of $(f \circ g)(8)$

$f \circ g(8) = g(8) = \sqrt{2(8)} = \sqrt{16} = 4$

$f(4) = 5(4^2) = 5 \cdot 16$

$f \circ g(8) = 80$

8. Find $f(g(x))$ if $f(x) = x^2 + 2x - 7$ and $g(x) = 4x + 5$

$(f \circ g)(x) = (4x+5)^2 + 2(4x+5) - 7$

$(4x+5)(4x+5) + (8x+10) - 7$

$16x^2 + 20x + 20x + 25 + 8x + 10 - 7$

$16x^2 + 48x + 28$

$f(g)(x) = 16x^2 + 48x + 28$

9. Simplify completely the expression $\frac{2x^{\frac{-1}{2}}}{x^{-1}}$

$2x^{-\frac{1}{2} - -1} = 2x^{\frac{1}{2}} = 2\sqrt{x}$

$2\sqrt{x}$

(10.) Evaluate: $\left(-\frac{1}{10}\right)^3$

$\left(\frac{1}{10}\right)\left(\frac{1}{10}\right)\left(\frac{1}{10}\right) = -\frac{1}{1000}$