WORK SHEET 1 FOR GRADE 11

RELATION AND FUNCTION

2001/33. Suppose $\frac{x-8}{x^3+4x} = g(x) - \frac{x+2}{x^2+4} and x \neq 0$. Which of the following is equal to $g(x)$?

A) $\frac{2x-1}{x^2+4}$ B) $\frac{2x+1}{x^2+4}$ C) $\frac{x+2}{x^2+4}$ D) $\frac{x-2}{x^2+4}$

2001/36. Which of the following is the inverse of $f(x) = 2 + \ln(x-1)$?

A) $g(x) = 2 + e^{x-1}$ C) $g(x) = 2 - e^{x-1}$

B) $g(x) = 1 + e^{x-2}$ D) $g(x) = 1 - e^{x-2}$

2002/5 For Which of the following does its graph lie both above and below the x −axis ?

A) $f(x) = (x+1)^2(2-x)^2$ C) $f(x) = (x^2+1)(x-1)^2$

B) $f(x) = -(x=2)^2(x-2)^2$ D) $f(x) = (x+1)^2(x^2-1)$

2003/2. Which of the following functions touches but never crosses the x- axis ?

A) $f(x) = 1 - x^3$ C) $f(x) = (x^2-1)^2$

B) $f(x) = x^4 - 1$ D) $f(x) = x - x^5$

2004/1. If $x < 0$, then the simplest form of $f(x) = \frac{x-|x|}{x}$ is equal to:

A) 2x B) 2 C) – 2 D) 0

2004/2. If $f(x) = \frac{\sqrt{x+2}}{x+2}$ and $g(x) = \frac{1}{x} - 2$, then $f(g(x))$ is equal to :

A) $\sqrt{x} - 2$ B) $\sqrt{x} + 2$ C) $\sqrt{x}$ D) $\frac{\sqrt{x}}{x}$

2004/3. If $f(x) = ln\left(\frac{x}{x-1} + 2\right)$, for x> 1, then which one of the following is the inverse of f ?

A) $g(x) = \frac{e^x-2}{e^x-3}$ B) $g(x) = \frac{e^x-2}{e^x+1}$ C) $g(x) = \frac{e^x}{e^x+1} - 2$ D) $g(x) = e^{\frac{x}{x-1}} - 2$

2005/31. Given $f(x) = ln(x-1)$ and g $(x) = \sqrt{1-2x}$. Which one of the following is the domain of fog ?

A) $\{x \in \mathbb{R}: x > 1\}$ B) $\left\{x \in \mathbb{R} : x \leq \frac{1}{2}\right\}$ C) $\{x \in \mathbb{R}: x < 0\}$ D) $\left\{x \in \mathbb{R} : x > \frac{1}{2}\right\}$

2005/10. What is the value of $|x| + 2x$ if $x < 0$?

A) – $3x$ B) 3x C) – x D) x

2005/18. If $f(x) = \frac{1}{e^x+1}$, then which one of the following is equal to $f^{-1}(x)$?

A) $ln(1-x) - ln(x)$ C) $ln\left(\frac{1}{x+1}\right)$

B) $e^x + 1$ D) $\frac{1}{e^x+1}$

2006/19. If $f(x) = \frac{x+1}{x-1}$ and f $(a) = 5$, then $f(2a)$ is equal to :

A) 2 B) 4 C) 6 D) 8

2006/20. If $f(x) = \sqrt[3]{1 + e^{-x}}$, which of the following is equal to $f^{-1}(x)$?

A) $ln\left(\frac{1}{x^3+1}\right)$ B) $\frac{1}{ln(x^3-1)}$ C) $ln(1-x^3)$ D) $(1+e^{-x})^3$

2007/12. Which of the following function is a one –to-one correspondence ?

A) : $R' \to \mathbb{R}$, $f(x) = \tan x$, **where** R' **is the domain of**

B) : $\mathbb{R} \to \mathbb{R}$, $g(x) = 2^x$

C) $h: [0, \infty) \to [0, \infty)$, $h(x) = x^2$

D) $r: [0, \infty) \to [0, \infty)$, $r(x) = x + 5$

2007/38. The inverse of the function defined by $g(x) = \frac{2x}{x+3}$ **is equal to:**

A) $g^{-1}(x) = -\frac{2x}{x-3}$ **C)** $g^{-1}(x) = -\frac{x-3}{2x}$

B) $g^{-1}(x) = -\frac{3x}{x-2}$ **D)** $g^{-1}(x) = -\frac{x+2}{3x}$

2008/5. Which of the following function is a one –to-one function ?

A) $f = \{(1,6), (2,7), (5,6), (1,8)\}$

B) $k: \mathbb{R} \to \mathbb{R}$ **is given** $k(x) = x - 3$

C) $h: (0, \infty \to \mathbb{R}$ **is given by** $h(x) = \log x$

D) $g: \{(x, y): x$ ***is a student and*** y ***is his or her rank*** $\}$

2008/32. The inverse of the function $f(x) = 1 + \frac{1}{2} ln(x-3)$ **is equal to :**

A) $f^{-1}(x) = -1 + 2e^{(x-3)}$ **C)** $f^{-1}(x) = -1 + e^{2(x-3)}$

B) $f^{-1}(x) = 3 + 2e^{(x-1)}$ **D)** $f^{-1}(x) = 3 + e^{2(x-1)}$

2008/46. If $f(x) = ln(x+1)$ **and g** $(x) = x^3 + 7$, **then what is the domain of** $(fog)(x)$ **?**

A) $(-2, \infty)$ **B)** $(-1, \infty)$ **C)** $[-2, \infty)$ **D)** $\emptyset$

2008/5. Which one of the following is a one-to-one correspondence function from $A = [0, 1]$ **to** $[1, 2]$ **?**

A) $f(x) = x$ **B)** $f(x) = \frac{1}{3}x^3 + 1$ **C)** $f(x) = 2x + 1$ **D)** $f(x) = x^2 + 1$

2008/35. If $f: A \to B$ **and** $g: B \to C$ **are functions, then which of the following is true about the composition function?**

A) Domain of $(gof) \subseteq$ **Domain of** f **C) Domain of** $(gof) \nsubseteq$ **Domain of** f

B) Range of $(gof) \nsubseteq$**Range of** g **D) Range of** $(gof \subseteq)$ **Range of** f

2008/36. If the point $(3, -2)$ **is on the graph of** $y = f(x)$ **,which is on the graph of** $y = f^{-1}(x)$ **?**

A) $\left(\frac{1}{3}, -2\right)$ **B)** $(3, -1)$ **C)** $(-2, 3)$ **D)** $\left(3, -\frac{1}{2}\right)$

2009/10 . Which one of the following is the inverse of $f(x) = 8x^3 + 2$ **?**

A) $f^{-1}(x) = \frac{1}{8x^3+2}$ **C)** $f^{-1}(x) = 8x^{-3} - 2$

B) $f^{-1}(x) = \frac{1}{2}\sqrt[3]{x-2}$ **D)** $f^{-1}(x) = \frac{1}{8}\sqrt[3]{x-2}$

2009/11. Which of the following function is a one –to-one correspondence ?

A) $f: [0, \infty) \to \mathbb{R}$ **defined by** $f(x) = |x|$ **C)** $f: \mathbb{R} \to [0, \infty)$ **defined by** $f(x) = 3^x$

B) $f: \mathbb{R} \to [0, \infty)$ **defined by** $f(x) = x^2$ **D)** $f: (0, \infty) \to \mathbb{R}$ **defined by** $f(x) = \log_2 x$

2009/12. If $f(x) = \sqrt{x^3}$ **and** $(fog)(x) = \sqrt[4]{x}$, **then what is the value of** $g(8)$**?**

A) $\sqrt[3]{2}$ **B)** 2 **C)** $\sqrt{2}$ **D)** $2\sqrt{2}$

2010/10. Which one of the following is true about signum absolute value as greatest integer functions?

A) $(x) = \pm x$, **for all** $x \in \mathbb{R}$ **C)** $|x| = x\, sgn(x)$ **,for all** $x \in \mathbb{R}$

B) $(x) \leq |x|$, **for all** $x \leq 0$ **D)** $sgn(x) \leq |x|$, **for all** $x \geq 0$

2010/33. Let $(x) = \frac{3x+1}{x\ -2}$, **then what is the range of** $f(x)$?

A) $\mathbb{R} \setminus \{2\}$ **B)** $\mathbb{R}$ **C)** $\mathbb{R} \setminus \{3\}$ **D)** $\mathbb{R} \setminus \left\{-\frac{1}{3}\right\}$

2010/42 . Let $f(x) = x - x^2$ and $g(x) = \frac{1}{x}$. Then what is $g\left(f\left(\frac{1}{x}\right)\right)$ equals to :

A) $x - x^2$ B) $\frac{x^2}{x_-1}$ C) $\frac{1}{x^2 - x}$ D) $\frac{x\ -1}{x^2}$

2011/4 . Which one of the following is equal to $f(x) = \sqrt{(x+4)^2}$ for every $x \in \mathbb{R}$

A) $g(x) = x + 4$ B) $g(x) = x + 2$ C) $g(x) = |x + 4|$ D) $g(x) = |x| + 4$

2011/38. If $f(x) = a\,x - b$ and $f^{-1}(x+1) = \frac{1}{2}\,x + 2$ for each $\in \mathbb{R}$, then what must be the values of a and b ?

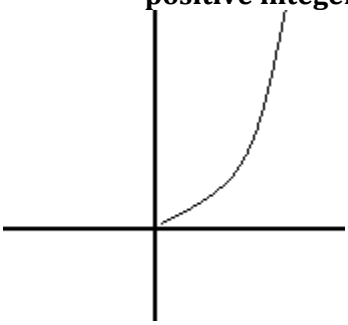
A) $a = \frac{1}{2}$ *and* $b = -2$ C) $a = 1$ *and* $b = 1$

B) $a = 2$ *and* $b = 2$ D) $a = 2$ *and* $b = 3$

2011/49. If f is the greatest integer function and g is the absolute value function then what is the value of $(fog)\left(\frac{1}{2}\right) + (gof)\left(-\frac{4}{3}\right)$?

A) 1 B) 3 C) -1 D) 2

2012/36. The following graph is the graph of the function $y = x^{\frac{m}{n}}$,where m and n are positive integers and $n \neq 0$.



Which of the following is true about m and n ?

A) m is odd, n is even and $m > n$. C) m is odd, n is even and $m < n$

B) m is even, n is odd and $m < n$. D) m is even, n is odd and $m > n$

2012/49. Let $f(x) = \sqrt{x\ +2}$ and g $(x) = x^2 - 1$. What are the domain and the range of the composition of f *with* g, fog respectively ?

A) $\mathbb{R}$ *and* $[1, \infty)$ C) $[0, \infty)$ *and* $[1, \infty)$

B) $\mathbb{R}$ *and* $[0, \infty)$ D) $[0, \infty)$ *and* $[0, \infty)$

2012/63. Let $f(x) = 3 - 2x$. What is the range of ?

A) $f^{-1}(x) = 2x - 3$ C) $f^{-1}(x) = \frac{3}{2} - \frac{x}{2}$

B) $f^{-1}(x) = 3\ + 2x$ D) $f^{-1}(x) = \frac{x}{2} - \frac{3}{2}$

2013/1. What is the domain and range of the function $f(x) = 2x^{\frac{3}{4}}$ respectively

A)$[0, \infty)$ *and* $(0, \infty)$ C) $[0, \infty)$ *and* $[0, \infty)$

B) $\mathbb{R}$ *and* $[0, \infty)$ D) $[0, \infty)$ *and* $\mathbb{R}$

2013/2. Which one of the following define a one- to- one function ?

A) $f = \{(x, y): y = 3x - 1\}$ C) $f = \{(x, y) : y$ *is a father of* $x\}$

B) $f = \{(x, y) : x$ *is a sister of* $y\}$ D) $f = \{(x, y): y = x^2 + 1\}$

2013/15. The inverse of the function $y = 3x - 5$ is equal to :

A) $y = \frac{x\ +\ 3}{5}$ B) $y = \frac{x\ +\ 5}{3}$ C) $y = -5x + 3$ D) $y = \frac{x\ -5}{3}$