

Section 7.1-7.3 Quiz Form B

1) Given $f(x) = x^2 + 4x - 2$ and $g(x) = 3x + 1$ calculate each function:

a) $(f + g)(x)$

$$x^2 + 4x - 2 + 3x + 1$$

$$\boxed{x^2 + 7x - 1}$$

b) $(f - g)(x)$

$$x^2 + 4x - 2 - 3x - 1$$

$$\boxed{x^2 + x - 3}$$

c) $(f \cdot g)(x)$

$$(x^2 + 4x - 2)(3x + 1)$$

$$3x^3 + 12x^2 - 6x + x^2 + 4x - 2$$

$$\boxed{3x^3 + 13x^2 - 2x - 2}$$

d) $(f \div g)(x)$

$$\frac{x^2 + 4x - 2}{3x + 1}, \quad \boxed{x \neq -\frac{1}{3}}$$

$$3x + 1 = 0$$

$$3x = -1$$

$$x = -\frac{1}{3}$$

2) For each pair of functions, find $f \circ g$ and $g \circ f$ if they exist:

a) $f(x) = \{(5, -2), (9, 8), (-4, 3), (0, 4)\}$
 $g(x) = \{(3, 7), (-2, 6), (4, -2), (8, 10)\}$

3 7 /	5 -2 6
-2 6 /	9 8 10
4 -2 /	-4 3 7
8 10 /	0 4 -2

$f \circ g =$ undefined

$g \circ f =$ $(5, 6), (9, 10), (-4, 7), (0, -2)$

b) $f(x) = \{(1, 0), (4, 5), (6, 5), (7, 0)\}$
 $g(x) = \{(0, 4), (5, 2)\}$

0 4 5	1 0 4
5 2	4 5 2
	6 5 2
	7 0 4

$f \circ g =$ $(0, 5)$

$g \circ f =$ $(1, 4), (4, 2), (6, 2), (7, 4)$

3) For the following find $[f \circ g](x)$ and $[g \circ f](x)$:

$f(x) = x^2 + 2x$ $g(x) = x - 9$

$$(x - 9)^2 + 2(x - 9)$$

$$x^2 - 18x + 81 + 2x - 18$$

$$[f \circ g](x) = \underline{x^2 - 16x + 63}$$

$$x^2 + 2x - 9$$

$$[g \circ f](x) = \underline{x^2 + 2x - 9}$$

4) If $f(x) = 6x$, $g(x) = -2x^2 + 5x - 1$, and $h(x) = 11x - 4$, calculate each value:

a) $f[g(3)]$

$$g(3) = -2(3)^2 + 5(3) - 1$$

$$= -18 + 15 - 1 = -4$$

$$f(-4) = 6(-4) = \boxed{-24}$$

b) $[f \circ h](-2)$

$$h(-2) = 11(-2) - 4$$

$$= -22 - 4$$

$$= -26$$

$$f(-26) = 6(-26)$$

$$= \boxed{-156}$$

c) $[h \circ (f \circ g)](4)$

$$g(4) = -2(4)^2 + 5(4) - 1$$

$$= -32 + 20 - 1 = -13$$

$$f(-13) = 6(-13) = -78$$

$$h(-78) = 11(-78) - 4 = \boxed{-862}$$

5) Find the inverse of each relation:

a) $\{(-2, 5), (0, 4), (1, -8), (4, 7)\}$

$$\{(5, -2), (4, 0), (-8, 1), (7, 4)\}$$

b) $\{(2, -5), (6, 6), (-1, 3), (7, 9)\}$

$$\{(-5, 2), (6, 6), (3, -1), (9, 7)\}$$

6) Find the inverse of each function:

a) $g(x) = 4x - 3$

$$y = 4x - 3$$

$$x = 4y - 3$$

$$x + 3 = 4y$$

$$\boxed{y = \frac{1}{4}x + \frac{3}{4}}$$

$f^{-1}(x)$

b) $f(x) = \frac{1}{4}x + 4$

$$y = \frac{1}{4}x + 4$$

$$x = \frac{1}{4}y + 4$$

$$x - 4 = \frac{1}{4}y$$

$$\boxed{y = 4x - 1}$$

$f^{-1}(x)$

7) Determine if each pair of functions are inverse functions or not:

a) $f(x) = 6x - 2$ and $g(x) = \frac{1}{6}x + 3$

$$6\left(\frac{1}{6}x + 3\right) - 2$$

$$x + 18 - 2$$

$$x + 16$$

$$\frac{1}{6}(6x - 2) + 3$$

$$x - \frac{1}{3} + 3$$

$\boxed{\text{not!}}$

b) $f(x) = 2x + 3$ and $g(x) = \frac{1}{2}(x - 3)$

$$2\left(\frac{1}{2}(x - 3)\right) + 3$$

$$x - 3 + 3$$

$$\underline{\underline{x}}$$

$$\underline{\underline{x}}$$

$\boxed{\text{yes}}$

8) Graph each function. State the domain, range, and the x and y-intercepts. You must include a table of values as part of your work:

a) $y = -\sqrt{x+1}$

x	y
-2	ER
-1	0
0	-1
1	-1.4
2	-1.7
3	-2

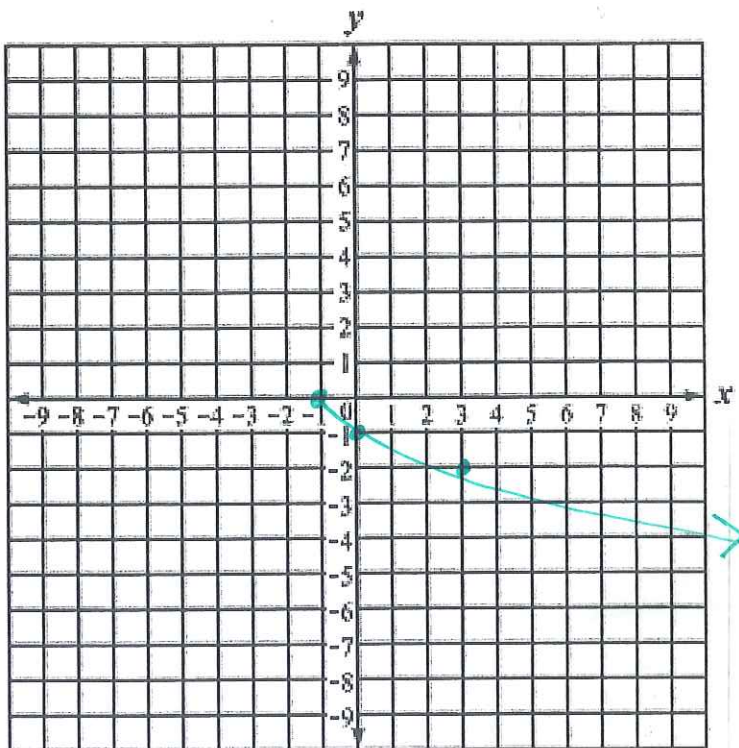
(6)

Domain: $x \geq -1$

Range: $y \leq 0$

X-Intercept: $x = -1$

Y-Intercept: $y = -1$



b) $y = \sqrt{2x+5} - 1$

x	y
-3	ER
-2	0
-1	0.7
0	1.2
1	1.6
2	2

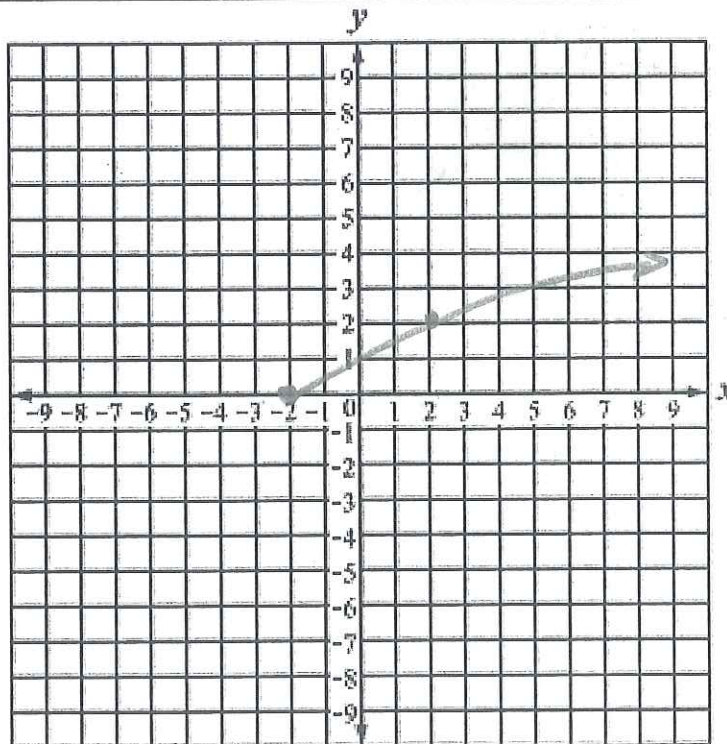
(6)

Domain: $x \geq -2$

Range: $y \geq 0$

X-Intercept: $x = -2$

Y-Intercept: $y = 1.2$

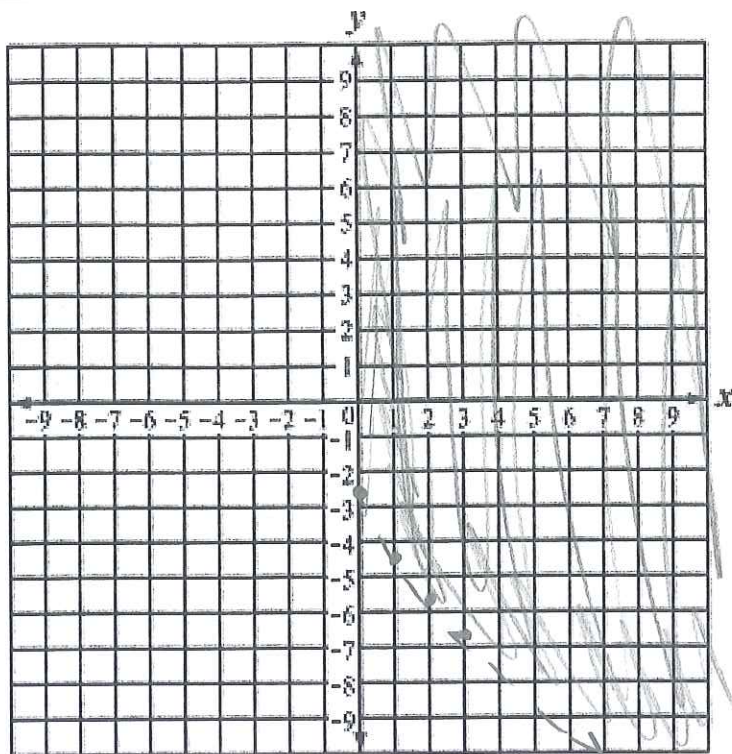


9) Graph each inequality. You must include a table of values as part of your work.

a) $y > -2\sqrt{3x+2}$

x	y
-1	Ev
0	-2.8
1	-4.5
2	-5.7
3	-6.7

(2)



b) $y \leq \sqrt{x} - 6$

x	y
-1	Ev
0	-6
1	-5
2	-4.5
3	-4.3

(2)

