Precalc Practice Test (1)

(1) Horizontal intercepts $y=0$

$0 = 2|x-3| - 8 \rightarrow |x-3| = 4$

$x-3=-4$ $\quad x-3=4$

$x=-1$ $\quad x=7$

$(-1,0)$ and $(7,0)$

Vertical intercepts

$f(0) = 2|0-3| - 8$

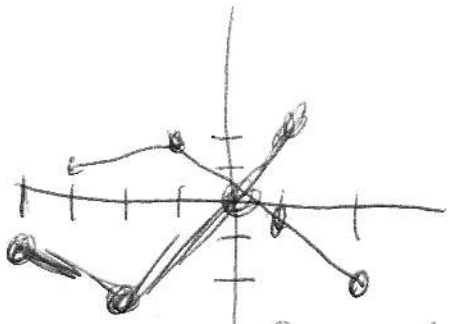
$2(3) - 8 = -2$

$(0,-2)$

(2) $2\sqrt{-(x-1)} + 1$ on $[-3,1)$

$-(x-2)^3 + 2$ on $[1,\infty)$

(3)



left 1 reflected around x-axis

Something like that

1) a) $f(x+3)$
b) $-f(x)$
c) $f\left(\frac{1}{2}x\right)$
d) $\frac{1}{2}f(x)$
e) $f(2x)$
f) $2f(x)$
g) $f(x)-2$
h) $f(x-5)$
i) $f(-x)$

5) $f(6) = 3$

$f(x) = 4 \quad x = 2$

$g^{-1}(7) \rightarrow g(x) = 7$

$x = 4$

$f(g(7))$ $\quad g(7) = 4$

$f(4) = 6$

$g(f(1)) \quad f(1) = 2$

$g(2) = 1$

(7) $f(x) = \begin{cases} -3|x+3|+4 & \text{on } (-\infty, 0) \\ x-1 & \text{on } [0, 2) \\ (x-4)^2 - 2 & \text{on } (2, \infty) \end{cases}$

(8) $\frac{-2}{\sqrt{x+1}}$

(a) $f(3) = \frac{-2}{\sqrt{4}} \to -\frac{1}{2}$

(b) $f^{-1}(6) = f(x) = 6$

$$\frac{6}{1} = \frac{-2}{\sqrt{x+1}}$$

$$6\sqrt{x+1} = -2$$

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

$$x+1 = \frac{1}{9}$$

$$\boxed{x = -\frac{8}{9}}$$

(6) Bank account

Slope $\frac{250-280}{3-2} = -30$

$y = -30x + b$ for $(2, 280)$

$280 = -30(2) + b$

$280 = -60 + b$

$340 = b$

(a) Balance = -30(Days Since Pay Check) $+ 340$

(b) $f(10) = -30(10) + 340$

$-300 + 340$

40

(c) for every day since the last payck her balance has decreased $30

(d) That is the amount of ~~[illegible]~~ her Payck.

(8) (c) $x > -1$ or $(-1, \infty)$

(d) $f(c-1) = \dfrac{-2}{\sqrt{c-1+1}} = \dfrac{-2}{\sqrt{c}}$

(e) $g(x) = x^2 - 1 \quad f(g(x))$

$$\frac{-2}{\sqrt{x^2-1+1}} \rightarrow \frac{-2}{\sqrt{x^2}} \rightarrow \frac{-2}{x}$$

domain Same as $\dfrac{-2}{\sqrt{x+1}}$ $\quad x+1 > 0$

$x > -1$

or

$(-1, \infty)$

(9) (a) $f(x) - 100$

(b) $f(x-100)$

(10) After 5 min ~~Flight~~ $f(5)$ is height (elevation)

(a) of the plane.

(b) Time would be the Time(5) when the plane is 300 ft up.

(11) on $[1,5]$ $\frac{2}{x+1}$ $f(5) = \frac{2}{6}$ or $\frac{1}{3}$

$f(1) = \frac{2}{2}$ or 1

$$\frac{\frac{1}{3} - 1}{5-4} \rightarrow \left[\frac{1}{3} - \frac{3}{3}\right] \cdot \frac{1}{1}$$

$$\frac{-2}{3}$$

(12) $f(x) = 2x^2 - 3$ on $[-2, b]$

$f(b) = 2b^2 - 3$

$f(-2) = 5$

$$\frac{2b - 3 - 5}{b - -2} = \boxed{\frac{2b - 8}{b + 2}}$$

(13)

1	2	3	4	5
14	10	4	-4	-14
	-4	-6	-8	-10
		-2	-2	-2

The change between points is getting more negative

decreasing, Concave down

(14) $f(g(3))$

$g(3) = -2$ Table

(a) $f(-2) = 1$ Graph

(b) $f(4) = 1$ graph

$g(1) = 8$ Table

(c) $g(0) = \text{table} = 1$

$f(1) = 2$ graph

$f(2) = 3$ graph

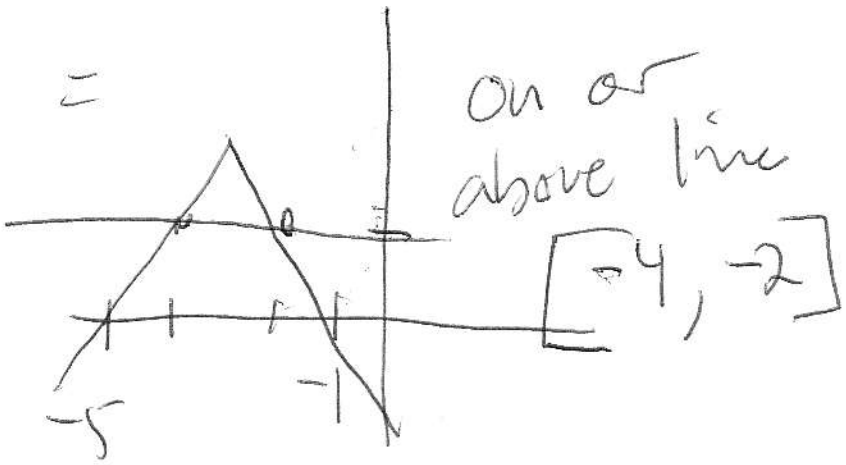
(d) $f(6) = -1$

$f^{-1}(-1) \rightarrow f(x) = -1$

$x = 6$

Inverses ~~Cancel each other~~ → Cancel each other

(15) =



on or above line

$[-4, -2]$

(16) $g(x)$ is not one to one, fails

(a) horizontal line test

(b) Decreasing $[0, 1) \cup (2, 4)$

Increasing $(1, 2) \cup (4, 5)$

(17) $f(-3) = \boxed{-3}$ using middle part

$f(-6) = -(-6) + 2 = \boxed{8}$ TOP

$f(3) = 2(3) - 3 = \boxed{3}$ Bottom

(18) $h(6) = 5$

$h(T) = 0 \quad T = 1$

$h(x) = 5 \quad x = 6$

$h(1) = 0$

(19) $f(g(x)) = \dfrac{\dfrac{2x}{1-x}}{1-\dfrac{2x}{1-x}} = \dfrac{\dfrac{2x}{1-x}}{\dfrac{1-x-2x}{1-x}} = \dfrac{2x}{1-x} \cdot \dfrac{1-x}{1-3x} = \dfrac{2x}{1-3x}$

(19) $f(x) = \frac{x}{2+x}$ $g(x) = \frac{2x}{1-x}$

$f(g(x))$ $\frac{\frac{2x}{1-x}}{2+\frac{2x}{1-x}} = \frac{\frac{2x}{1-x}}{\frac{2(1-x)+2x}{1-x}} \quad \frac{\frac{2x}{1-x}}{\frac{2-2x+2x}{1-x}}$

$\frac{\frac{2x}{1-x}}{\frac{2}{1-x}} = \frac{2x}{1-x} \cdot \frac{1-x}{2} = x$

f is the inverse of g

(19) (b) $gf(x)$ $\dfrac{2\left(\dfrac{x}{2+x}\right)}{1-\dfrac{x}{2+x}}$

$\dfrac{\dfrac{2x}{2+x}}{\dfrac{2+x-x}{2+x}}$ $\dfrac{\dfrac{2x}{2+x}}{\dfrac{2}{2+x}}$ $\dfrac{\cancel{2x}}{\cancel{2+x}} \cdot \dfrac{\cancel{2+x}}{\cancel{2}} = x$

g is the inverse of f

I posted 20