

Review Set 2B # 2-7, 9

① a. domain: \mathbb{R}
range: $y \geq -4$

b. domain: $(-\infty, 0) \cup (0, 2) \cup (2, \infty)$
(or \mathbb{R} , except $x \neq 0, 2$)
range: $(-\infty, -1] \cup (0, \infty)$

② a. $(f \circ g)(x) = 2(x^2 + 2) - 3$
 $= 2x^2 + 1$

b. $(g \circ f)(x) = (2x - 3)^2 + 2$
 $= 4x^2 - 12x + 11$

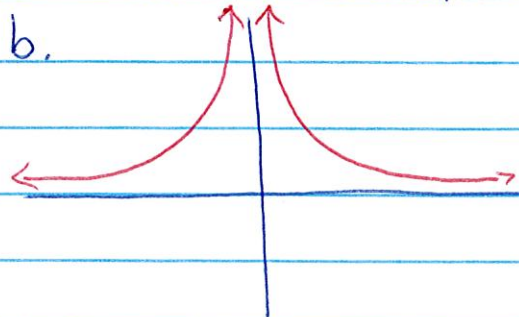
③ a. $\frac{(x-8)(x+2)}{x-3}$



b. $\frac{x+9}{x+5} + \frac{x(x+5)}{1(x+5)} = \frac{x+9+x^2+5x}{x+5} = \frac{x^2+6x+9}{x+5}$
 $= \frac{(x+3)^2}{x+5}$



④ a. $f(x)$ is undefined at $x=0$.



c. domain: \mathbb{R} , except $x \neq 0$
range: $y > 0$

⑤ a. Since VA is $x = -1$, $b = -1$.

Since HA is $y = 2$, $a = 2$.

b. (Hint: switch domain & range of $f(x)$.)

domain of $f^{-1}(x)$: \mathbb{R} , except $x \neq 2$.

range of $f^{-1}(x)$: \mathbb{R} , except $y \neq -1$.

⑥ a. HA at $y = -4$, VA at $x = 2$.

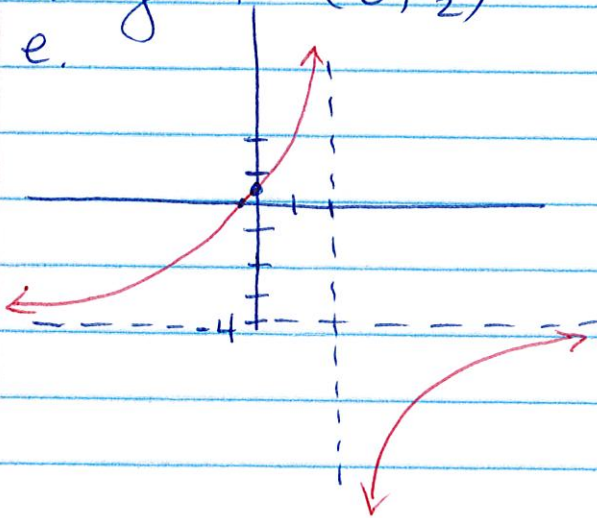
b. domain: \mathbb{R} , except $x \neq 2$.

range: \mathbb{R} , except $y \neq -4$.

c. omit, for now...

d. y-int: $(0, \frac{1}{2})$ x-int: $(-\frac{1}{4}, 0)$

e.



⑦ a. $(g \circ f)(x) = g(f(x)) = \frac{2}{3x+1}$

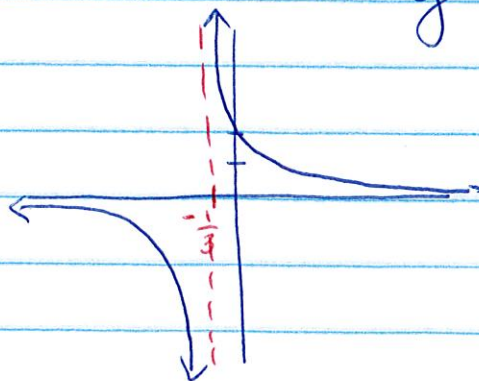
b. $\frac{2}{3x+1} = -4$

$$-12x - 4 = 2$$

$$-12x = 6$$

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

c. HA at $y = 0$, VA at $x = -\frac{1}{3}$



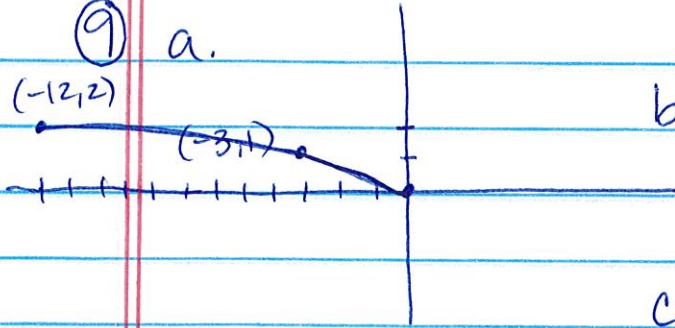
range: \mathbb{R} , except $y \neq 0$

9

a.

$(-12, 2)$

$(-3, 1)$



b. range of $f^{-1}(x) : 0 \leq y \leq 2$

c. $-3x^2 = -10$

$$x^2 = \frac{10}{3}$$

$$x = \sqrt{\frac{10}{3}}$$

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

(use graph)

$$x = -3$$