

P. 25

2) a) $f(x-3)$ for $f(x) = 2x^2 - 3x + 1$

$$\begin{aligned} f(x-3) &= 2(x-3)^2 - 3(x-3) + 1 \\ &= 2(x^2 - 6x + 9) - 3x + 9 + 1 \\ &= 2x^2 - 12x + 18 - 3x + 9 + 1 \\ &= 2x^2 - 15x + 28 \end{aligned}$$

b) $f(x) = 2x + 7$ and $g(x) = 1 - x^2$, find $(f \circ g)(x)$

$$\begin{aligned} (f \circ g)(x) &= f(g(x)) = f(1 - x^2) \\ &= 2(1 - x^2) + 7 \\ &= 2 - 2x^2 + 7 \\ &= 5 - 2x^2 \end{aligned}$$

3)

a) $f(x) = \frac{3x+17}{2}$

$$2 \cdot x = \frac{3y+17}{2} \cdot 2$$

$$2x = 3y + 17$$

$$2x - 17 = 3y$$

$$\frac{2x-17}{3} = y = f^{-1}(x)$$

b) $g(x) = 5x^3 - 4$

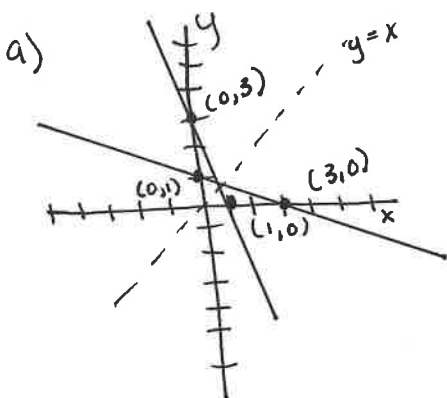
$$x = 5y^3 - 4$$

$$x + 4 = 5y^3$$

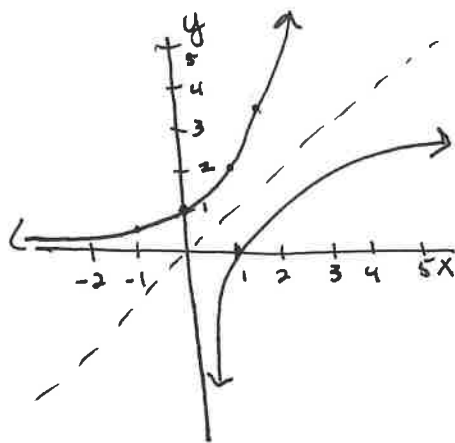
$$\frac{x+4}{5} = y^3$$

$$\sqrt[3]{\frac{x+4}{5}} = y = g^{-1}(x)$$

6)



b)



8 a) $f(x) = x$

$$+f(x) = 2(-3x+3)+2$$

$$f(x) = +2(-3x+3)+2$$

b) $f(x) = x^2$

$$-f(x) = \frac{1}{4} \left(\frac{1}{3}x - 5 \right)^2 - 1$$

10 $f(x) = 2x^3 + 3$; $g(x) = 3x - 2$

a) $g(0) = 3(0) - 2 = -2$

b) $(f \circ g)(0) = f(g(0)) = f(-2) = 2(-2)^3 + 3$
 $= 2(-8) + 3$
 $= -16 + 3$
 $= -13$

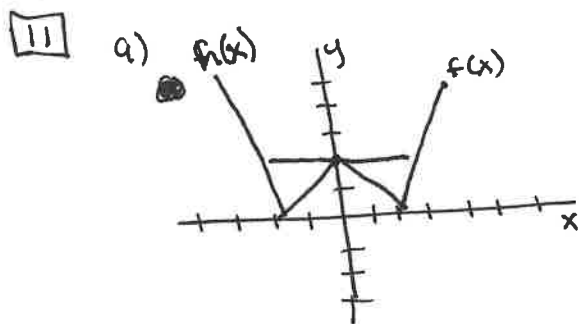
c) $f^{-1}(x)$

$$x = 2y^3 + 3$$

$$x - 3 = 2y^3$$

$$\frac{x-3}{2} = y^3$$

$$\sqrt[3]{\frac{x-3}{2}} = y = f^{-1}(x)$$



b) $A(3, 2)$
 $+1 \ x^{\frac{1}{2}}$
 $P(4, 1)$

Vert stretch $\frac{1}{2}$
Shift right 1

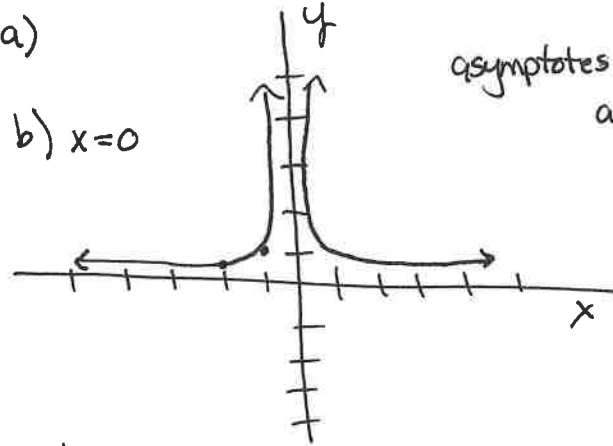
5) $f(x) = \frac{1}{x^2}$

x	$f(x) = \frac{1}{x^2}$
-2	$\frac{1}{4}$
-1	$\frac{1}{1} = 1$
0	und ($\frac{1}{0^2}$)
1	$\frac{1}{1}$
2	$\frac{1}{4}$

⊗

a)

b) $x=0$



asymptotes at $x=0$ horizontal
and $y=0$ vertical

c) D: $\{x \mid x \neq 0\}$

R: $\{y \mid y > 0\}$

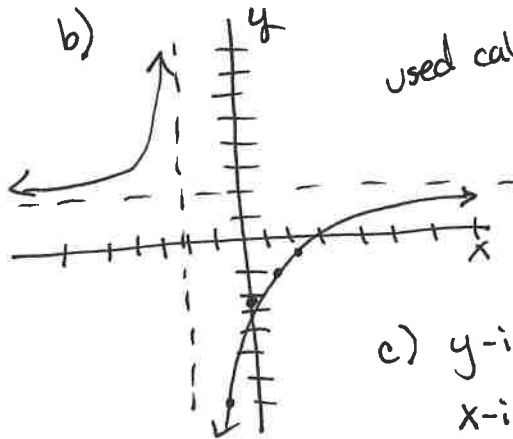
6) $f(x) = \frac{2x-5}{x+2}$

x	y
-2	$\frac{2(-2)-5}{-2+2} = \frac{-9}{0}$ und
-1	$\frac{2(-1)-5}{-1+2} = -7$
0	$-\frac{5}{2}$
1	$-\frac{3}{3} = -1$
2	$\frac{1}{4}$

a) vert asymptote
at $x = -2$

horiz. asymptote
at $y = 2$

b)



used calculator

c) y-int: $-\frac{5}{2}$ or -2.5

x-int: 2.5