Assignment Date ______

Q1) a) $f(x) = \sqrt{4-\sqrt{x}}$

$4-\sqrt{x} \geq 0$ $\sqrt{x} \geq 0$

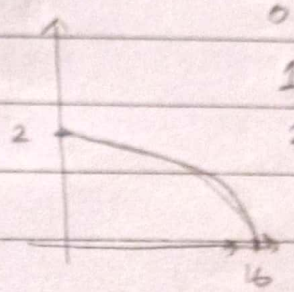
$4 \geq \sqrt{x}$ $x \geq 0$

$16 \leq x$

Domain Range

$[0, 16]$ $[0, 2]$

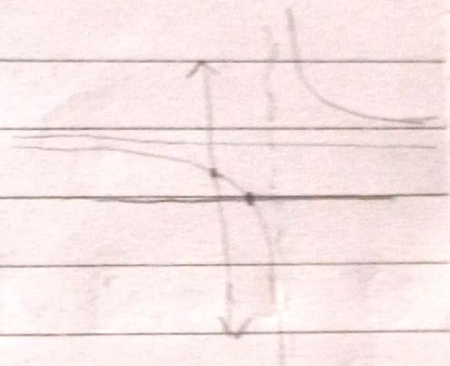
x	y
0	2
1	1.7
2	1.6
9	1
16	0



b) $\frac{2-3x}{7-2x}$

$7-2x = 0$

$x = 7/2$



Domain Range

$[-\infty, 7/2 - \delta] \cup [7/2 + \delta, \infty]$ $[-\infty, \infty]$

Q2 $f(x) = \frac{4x}{3-x}$

$\frac{4(0)}{3-(0)} = 0$ $(0,0)$

$\frac{4(1)}{3-1} = \frac{4}{2} = 2$ $(1,2)$

Hence shown

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Q3) $3-x=0$ $(0,0)$ $(1,2)$

$\boxed{x=3}$

a) Discontinuity at $x=3$

b)

-3	-2
-2	1.6
-1	-1
0	0
1	2
2	8
3	Undefined
4	-16

It because denominator becomes zero at $x=3$. This causes infinite discontinuity

c) $[-\infty,3) \cup (3,\infty]$

d)

$$\begin{cases} x^2-1 & -1\leq x<0 \\ 2x & 0<x<1 \\ -2x+4 & 1\leq x<2 \\ 0 & 2<x<3 \end{cases}$$

Q4)

$$f(x)=\begin{cases} 4x^2+ax+b & x<3 \\ a+b-2 & x=3 \\ 2x^3-bx+a & x>3 \end{cases}$$

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$4(3)^2+3a+b = 36+3a+b$

$2(3)^3-3b+a = 54-3b+a$

$36+3a+\cancel{b} = a+\cancel{b}-2 \qquad a=-19$

$54-3b+\cancel{a} = \cancel{a}+b-2$

$54-3b = b-2 \qquad b=14$

small

Q5) a) $L = \dfrac{2(\infty)^4 \cancel{-4(\infty)^2+5}}{3(\infty)^4 \cancel{-7(\infty)+2}}$ too small

$L = \dfrac{2}{3}$

b) $M = \dfrac{x^3-5x+4}{x^3-8x-3} \qquad \dfrac{16}{0}$

$\dfrac{\cancel{(x-3)}(x-1)(x+4)}{\cancel{(x-3)}(x^2+3)} = \dfrac{(x-1)(x+4)}{(x^2+3)}$

↳ sub 3

$= 7/6$

c) $N = \dfrac{3x^3-7x^2+6x-2}{x-1}$

(x-1) is a factor

1	3	-7	6	-2
	↓	3	-4	2
	3	-4	2	0

$\dfrac{(3x^2-4x+2)\cancel{(x-1)}}{\cancel{(x-1)}}$

$3(1)-4(1)+2 = 1$

$M = 1$