Chapter 1

① a. $2((x+3)(x-3)+1)^2$

$2(x^2-9+1)^2$

$2(x^2-8)^2 = 2(x^2-8)(x^2-8)$

$2(x^4-16x^2+64) = \boxed{2x^4-32x^2+128}$

b. $g(x) = x^2-9$

$f(x) = (x+1)(x+1) = (x^2+2x+1)2 = 2x^2+4x+2$

$g(f(x)) = \boxed{(2x^2+4x+2)^2-9}$

expand if you want

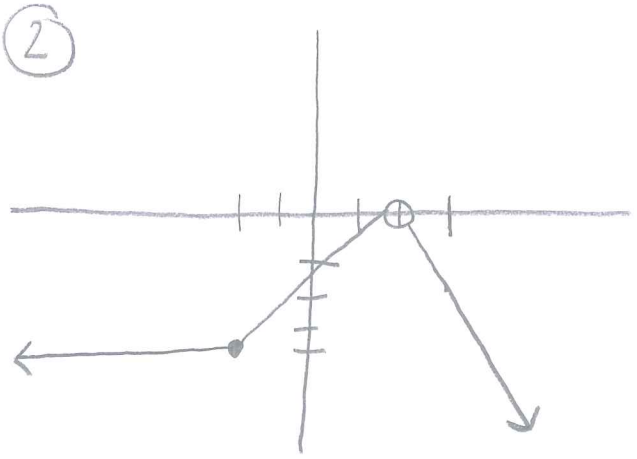
c. $((c^2+1)+3)((c^2+1)-3)$

$(c^2+4)(c^2-2) = \boxed{c^4+2c^2-8}$

d. $K(x) = x+1$
$h(x) = 2x^2$ Other answers possible

e. $(-\infty, \infty)$

f. no. one-to-one means it passes the horizontal line test.

② 

Chapter 2

1. a. $f(x) = x^2+2x-35$

$y = x^2+2x-35$

$y+35 = x^2+2x$

$y+35+\underline{1} = x^2+2x+\underline{1}$

$y+36 = (x+1)^2$

$y = (x+1)^2-36$

V. $= (-1,-36)$

minimum value

zeros: $(x+7)(x-5)$

$(-7,0)(x+5)$

b. $f(x) = 4x^2 - 8x - 1$

$y = 4x^2 - 8x - 1$

$y + 1 = 4x^2 - 8x$

$y + 1 + \_\_\_ = 4x^2 - 8x + \_\_\_$

$y + 1 + 4 = 4(x^2 - 2x + 1)$

$y + 5 = 4(x-1)^2$

$y = 4(x-1)^2 - 5$

Vertex $= (1, -5)$

minimum

Zeros: $0 = 4(x-1)^2 - 5$

$5 = 4(x-1)^2$

$\frac{5}{4} = (x-1)^2$

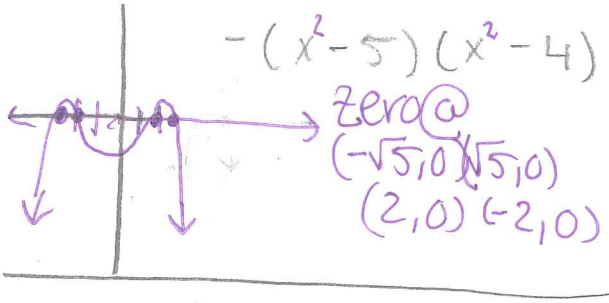
$\sqrt{\frac{5}{4}} + 1 = x$ $\left(\frac{\sqrt{5}}{2} + 1, 0\right)$

$\pm \frac{\sqrt{5}}{2} + 1 = x$ $\left(-\frac{\sqrt{5}}{2} + 1, 0\right)$

2. $F(x) = -x^4 + 9x^2 - 20$

$-(x^4 - 9x^2 + 20)$

$-(x^2 - 5)(x^2 - 4)$



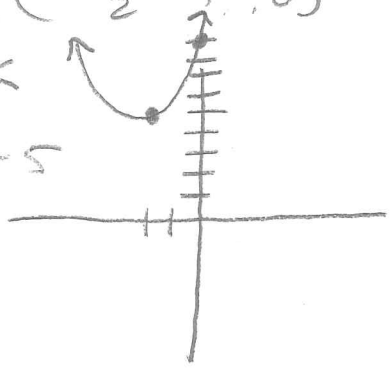
3. $y = a(x-h)^2 + k$

$9 = a(0+2)^2 + 5$

$9 = a(4) + 5$

$9 = 4a + 5$

$4 = 4a$, $a = 1$



Standard/vertex form $= y = (x+2)^2 + 5$

Quadratic form: $(x+2)(x+2) + 5$

$x^2 + 4x + 4 + 5$

$\boxed{y = x^2 + 4x + 9}$

NO x-intercepts

4.

	x^3	$5x^2$	$-8x$	19	
x^4	x^4	$5x^3$	$-8x^2$	$19x$	x
$7x^3$	$2x^3$	$10x^2$	$-16x$	38	2
	$2x^2$	$3x$	14		

$= \boxed{x^3 + 5x^2 - 8x + 19 + \frac{-24}{x+2}}$

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

7. $(x+1)(x-1)(x+2i)(x-2i)$

multiply out

6. g. $f(x) = \frac{4+i}{4-i} \cdot \frac{4+i}{4+i} = \frac{16+8i+i^2}{16-i^2}$

$= \boxed{\frac{15+8i}{17} = \frac{15}{17} + \frac{8}{17}i}$

h. $\frac{5}{1+i} - \frac{3i}{1-i}$

$\frac{5(1-i)}{(1+i)(1-i)} - \frac{3i(1+i)}{(1-i)(1+i)} = \frac{5-5i-3i-3i^2}{2}$

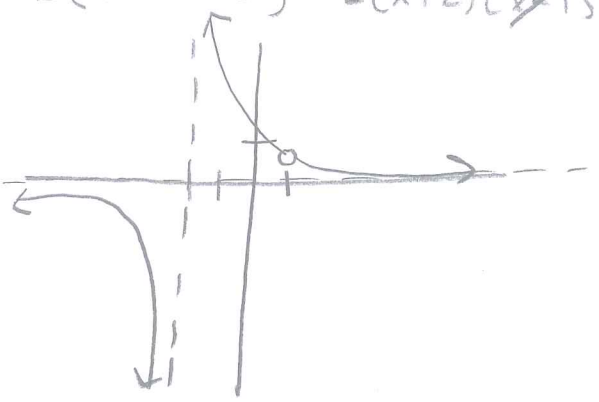
$= \frac{5-8i+3}{2} = \frac{8-8i}{2}$

$= \boxed{4-4i}$

8. $f(x) = \frac{3x-3}{2x^2+2x-4} = \frac{3(x-1)}{2(x^2+x-2)} = \frac{3(x-1)}{2(x+2)(x-1)} = \frac{3}{2(x+2)}$

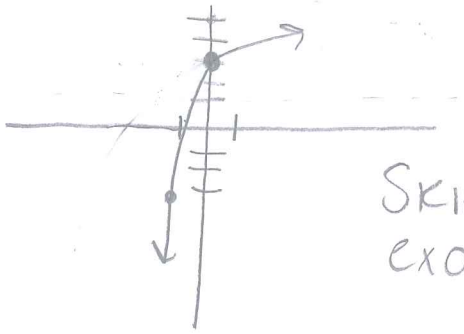
H.A @ $y=0$
V.A @ $x=-2$
Hole @ $(1, \frac{1}{2})$

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



Chapter 3

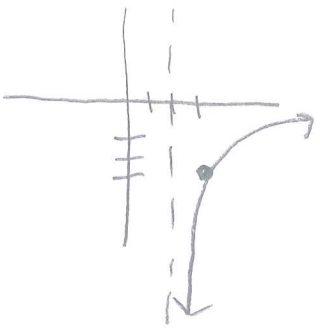
1. a. $f(x) = 4 - e^{-2x} = -e^{-2x} + 4$



e^x has point @ $(0,1)$ and H.A. @ $y=0$

SKIP, you wont have to graph this on exam.

b. $f(x) = \log_3(x-2) - 3$



2. 1. $\log_5 x + 2\log_5 w$

2. $\log_2 \frac{\sqrt{x}\, u}{z^5 y^3}$

3. $\log_{1/3} 27$

$\frac{1}{3}^x = 27$

$\boxed{x = -3}$

4. $\log_4 256 = 4$

5. $3 = \frac{x-2}{x}$

$3x = x - 2$

$2x = -2$

$x = -1$ extraneous so no value exists.

Chapter 4

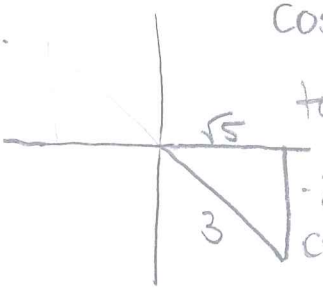
1. $\frac{-25\pi}{12} + \frac{24\pi}{12} = \frac{-\pi}{12} + \frac{24\pi}{12} = \boxed{\frac{23\pi}{12}}$

Keep adding until positive

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

$4 + b^2 = 9$ $b^2 = 5$ $b = \sqrt{5}$

2.



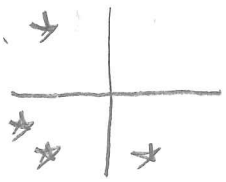
$\cos\theta = \frac{\sqrt{5}}{3}$

$\tan\theta = \frac{-2}{\sqrt{5}}$

$\cot\theta = \frac{\sqrt{5}}{2}$

$\csc\theta = \frac{-3}{2}$

$\sec\theta = \frac{3}{\sqrt{5}}$

3. 

Q3

4. $\frac{\pi}{3}$

Chapter 7

1. $\begin{bmatrix} 4 & 0 & -4 \\ 4 & -3 & -1 \end{bmatrix} \cdot \begin{bmatrix} 0 \\ 25 \\ 0 \end{bmatrix} = \begin{bmatrix} 0 \\ -75 \end{bmatrix}$

$2 \times 3 \quad 3 \times 1$

2. $ad - bc = -8 - -15 = 7$

3. $ad - bc = 72 - 81 = -9$

$$\frac{1}{-9}\begin{bmatrix} 8 & -9 \\ -9 & 9 \end{bmatrix} = \begin{bmatrix} \frac{-8}{9} & 1 \\ 1 & -1 \end{bmatrix}$$