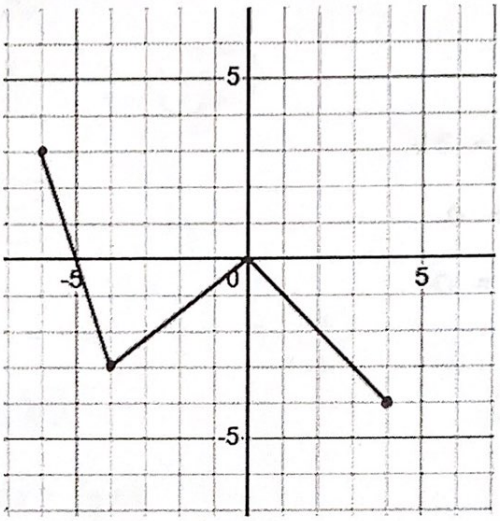
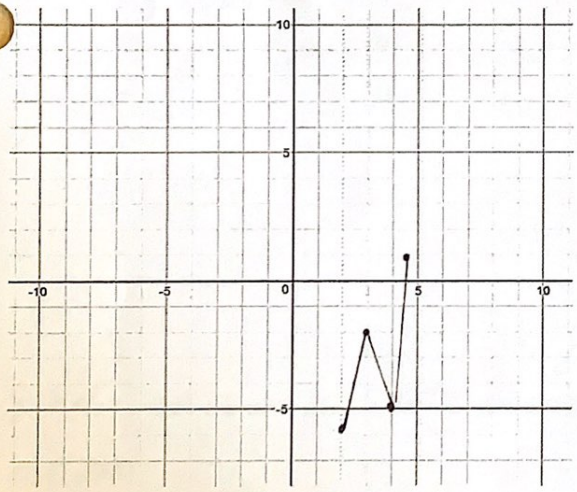
Pre-Calculus 12 : Final Exam Written Answer Practice

1. The graph of $y = f(x)$ is shown below.



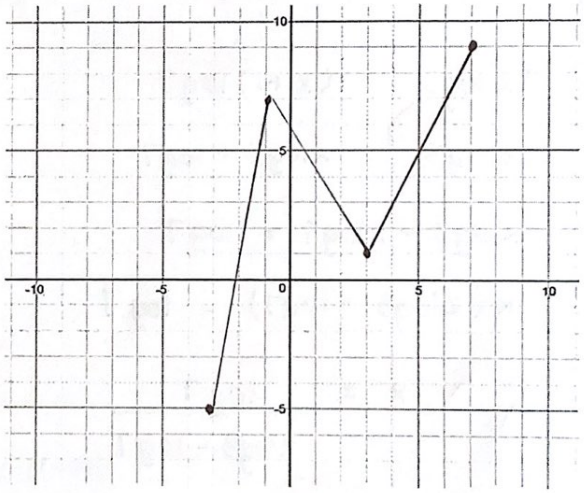
a) Sketch the graph of $y + 2 = f(-4x + 12)$



$y = f(-4(x-3)) - 2$

+3	$\cdot -1/4$ x	y	-2
4.5	~~1.5~~ -6	~~3~~	1
4	~~1~~ ~~-4~~	~~-3~~	-5
3	~~0~~ ~~0~~	~~0~~	-2
2	~~-1~~ ~~4~~	~~-4~~	-6

b) a) Sketch the graph of $y - 1 = -2f(x - 3)$



$y = -2f(x-3) + 1$

+3	x	y	$\cdot -2$	+1
-3	~~-6~~	~~3~~	~~-6~~	-5
-1	~~-4~~	~~-3~~	~~6~~	7
3	~~0~~	~~0~~	~~0~~	1
7	~~4~~	~~-4~~	~~-8~~	9

2. Solve the following equations algebraically.

a) $\log_6(x-3)+\log_6(x+6)=2$

rest. $x > 3$ $x > -6$

$\log_6 (x-3)(x+6) = 2$

$(x-3)(x+6) = 6^2$

$x^2 + 6x - 3x - 18 = 36$

$x^2 + 3x - 54 = 0$

$(x+9)(x-6) = 0$

$\cancel{x = -9}$ $x = 6$

doesn't meet restriction.

b) $3^{2x} = 7^{x+1}$

$2x \log 3 = (x+1)\log 7$

$2x \log 3 = x\log 7 + \log 7$

$2x\log 3 - x\log 7 = \log 7$

$x(2\log 3 - \log 7) = \log 7$

$$x = \frac{\log 7}{2\log 3 - \log 7}$$

$x = 7.74$

3. For the function $f(x) = \frac{x^2+12x+32}{x^2+10x+16}$, determine the following (if they exist) :

$$f(x) = \frac{\cancel{(x+8)}(x+4)}{\cancel{(x+8)}(x+2)}$$

$$= \frac{x+4}{x+2}$$

x – intercept $\quad x+4=0$

$x=-4$

y – intercept $\quad y = \frac{0+4}{0+2} = \frac{4}{2}$ $\quad y=2$

Vertical asymptote $\quad x=-2$

Point of discontinuity $\quad$ at $x=-8$ $\quad y = \frac{-8+4}{-8+2} = \frac{-4}{-6} = \frac{2}{3}$

$\left(-8, \frac{2}{3}\right)$

4. Rewrite $y = \frac{-5x+1}{x+2}$ in the form $y = \frac{a}{x-h} + k$

$$\begin{array}{r|l} & -5 \\ x+2 & -5x+1 \\ & -(-5x-10) \\ \hline & 11 \end{array}$$

$y = \frac{11}{x+2} - 5$

5. If $f(x) = 2x^2 + 5$ and $g(x) = \sqrt{x-2}$; determine the value of :

a) $f(g(6))$

$g(6) = \sqrt{6-2} = 2$

$f(2) = 2(2)^2 + 5$

$= 8 + 5$

$= 13$

$f(g(6)) = 13$

b) $g(f(-1))$

$f(-1) = 2(-1)^2 + 5$

$= 2 + 5$

$= 7$

$g(7) = \sqrt{7-2}$

$= \sqrt{5}$

$g(f(-1)) = \sqrt{5}$

6. Prove the identity.

$$\sec x = \frac{2\csc 2x \tan x}{\sec x}$$

$$\frac{2 \cdot \frac{1}{\sin 2x} \cdot \frac{\sin x}{\cos x}}{\sec x}$$

$$\frac{\cancel{2} \cdot \frac{1}{\cancel{2}\cancel{\sin x}\cos x} \cdot \frac{\cancel{\sin x}}{\cos x}}{}$$

$$\frac{1}{\cos^{\cancel{2}} x} \cdot \cancel{\cos x}$$

$$\frac{1}{\cos x}$$

$$\sec x$$