نام و نام خانوادگی ...... پاسخنامه تشریحی تکلیف شماره ...... کلاس ......

1

$-\sin x + \log y = 4$

$\log y = 4 + \sin x \to -1 \le \sin x \le 1$

$\to \sin x = \log y - 4 \to -1 \le \log y - 4 \le 1$

$\to 3 \le \log y \le 5 \Rightarrow 10^3 \le y \le 10^5$

$R_y = [10^3, 10^5]$

$R_f = [0, 1) \to R_{f^2} = [0, 1)$

$R_{f^2+2} = [0, 4)$

2

$f(x) = \sqrt{\dfrac{x^2-4}{x^2-9}} \to y = \sqrt{\dfrac{x^2-4}{x^2-9}} \Rightarrow y^2 = \dfrac{x^2-4}{x^2-9} \Rightarrow y^2x^2 - 9y^2 = x^2 - 4$

$y^2x^2 - x^2 = 9y^2 - 4 \Rightarrow x^2(y^2-1) = 9y^2 - 4 \Rightarrow x^2 = \dfrac{9y^2-4}{y^2-1} \Rightarrow x = \pm\sqrt{\dfrac{9y^2-4}{y^2-1}}$

$y^2 = 1 \to \pm 1$

-1	$-\frac{2}{3}$	$\frac{2}{3}$	1
$+$	$-$	$+$	$-$	$+$

$R_f = [0, \frac{2}{3}] \cup (1, +\infty)$

$a = 0$, $b = \frac{2}{3}$, $c = 1$

$a + b + c = 0 + \frac{2}{3} + 1 = \boxed{\frac{5}{3}}$

3

$f(x) = x + \dfrac{1}{x} + 2\sqrt{x + \dfrac{1}{x}}$, $\sqrt{x + \frac{1}{x}} = t$

$t^2 + 2t = 0$, $\min = 2 + 2\sqrt{2}$

$\max = \infty$

$\boxed{\frac{-b}{2a} = -\frac{2}{2}}$

$R_f = [2 + 2\sqrt{2}, +\infty)$

$y = (3 - \sin x)(1 + \sin x)$

$y = 3 + 2\sin x - \sin^2 x \Rightarrow 3 + 2 - 1 = 4$

$3 - 2 - 1 = 0$

$\frac{-b}{2a} = \frac{-2}{2(-1)} = 1 = \max \to 3 + 2 - 1 = 4$

$\boxed{R_f = [0, 4]}$

4

$f(x) = -\frac{1}{3}x + 10$

$\{(1, 10 - \frac{1}{3}), (2, 10 - \frac{2}{3}), (3, 9), (4, 10 - \frac{4}{3}), (5, 10 - \frac{5}{3}), (6, 8), (7, 10 - \frac{7}{3}), (8, 10 - \frac{8}{3}), (9, 7)\}$

$(10 - \frac{1}{3}) + (10 - \frac{2}{3}) + (10 - \frac{4}{3}) + (10 - \frac{5}{3}) + (10 - \frac{7}{3}) + (10 - \frac{8}{3}) = 60 - \frac{27}{3} = 60 - 9 = 51$

$51 + 8 + 9 + 7 = \boxed{75}$

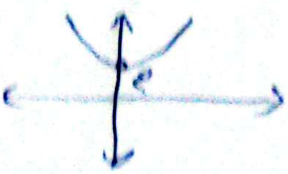
5

$f(x) = \sqrt{ax^2 + bx + c} \xRightarrow{a=0} \sqrt{bx + c} \Rightarrow \sqrt{2b + c} = 0 \Rightarrow c + 2b = 0$

$c = -2b$

$f(4) = 1 \to 1 = \sqrt{4b + c} \Rightarrow 1 = 4b + c \to 1 = 4b - 2b$

$g(x) = \sqrt{\underbrace{x^2 + 4}_{M}}$



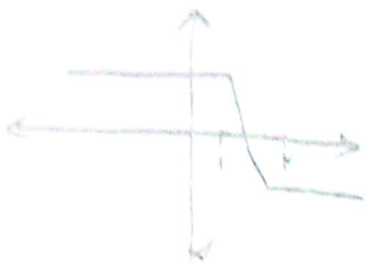
$R_M = [4, +\infty)$

$R_g = [2, +\infty)$

فرید غازی

۶

$|x-۲| - |x-۱| = kx$

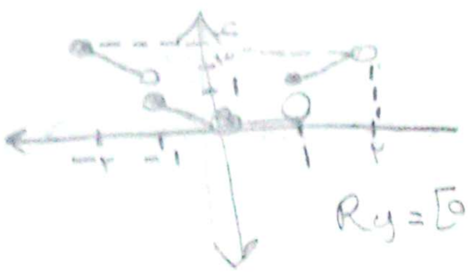


$y = kx \Rightarrow ۲k = -۱$

$k = -\frac{۱}{۲}$

۷

$y = x[x]$

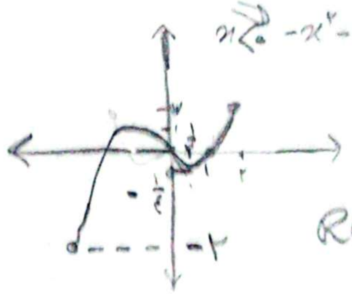


$R_y = [۰,۴] - \{۲\}$

$y = x|x| - x \xrightarrow{x \geq ۰} x^۲ - x \Rightarrow x(x-۱)$

$\xrightarrow{x < ۰} -x^۲ - x$

$-\frac{b}{۲a} = \frac{-(-۱)}{۲(۱)} = \frac{۱}{۲}$

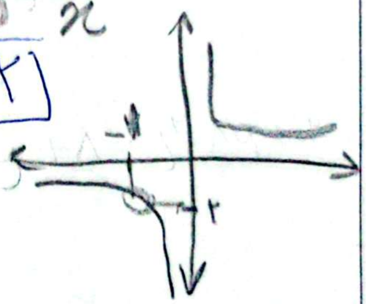


$R_y = [-۲,۲]$

۸

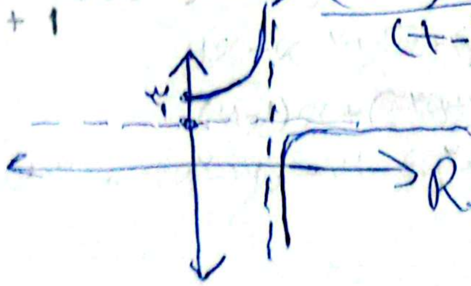
$y = \frac{۱(x+۱)}{x(x+۱)} + \frac{۱(x)}{(x+۱)(x)} + \frac{۱}{x^۲+x} = \frac{۲x+۲}{x^۲+x} = \frac{۲(x+۱)}{x(x+۱)} = \frac{۲}{x}$

$R_y = \mathbb{R} - \{۰, -۲\} , a+b = ۰-۲ = \boxed{-۲}$



۹

$y = \frac{x - ۴\sqrt{x} + ۳}{x - ۲\sqrt{x} + ۱} \Rightarrow \xrightarrow{\sqrt{x} = t} \frac{(t-۱)(t-۳)}{(t-۱)^۲} = \frac{t-۳}{t-۱} = \frac{\sqrt{x}-۳}{\sqrt{x}-۱}$



$R_f = (-\infty, +\infty) - \{۱\}$

۱۰

$f(x) = \frac{x^۳ + ۲x^۲ - x - ۲}{x^۲ - ۱} = \frac{x^۲(x+۲) - (x+۲)}{(x-۱)(x+۱)} = \frac{(x+۲)(x^۲-۱)}{(x^۲-۱)} = x+۲$

$f(۱) = ۱+۲ = ۳$ حفره

$f(-۱) = -۱+۲ = ۱$ حفره

$\rightarrow ۳+۱ = ۴$