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sec 004
ลำดับที่ 55

HW CH3

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1. for $g(x) = x^2 + 2x$, find

a.) $g(3+7) = g(10)$
$= (10)^2 + 2(10)$
$= 100 + 20$
$= 120$

b.) $g(3) + g(7)$
$= [(3)^2 + 2(3)] + [(7)^2 + 2(7)]$
$= 15 + 63$
$= 78$

c.) $g(3+h) = (3+h)^2 + 2(3+h)$
$= 9 + 6h + h^2 + 6 + 2h$
$= h^2 + 8h + 15$

d.) $\dfrac{g(3+h) - g(3)}{h}$
$= \dfrac{(h^2 + 8h + 15) - 15}{h}$
$= \dfrac{h^2 + 8h}{h}$
$= h + 8$

2. Find the domain of each function

a.) $f(x) = 2x^3 - x^2 + 3$
$\therefore D_f = \mathbb{R}$

b.) $g(x) = \dfrac{x-2}{x+4}$ → $x+4 \neq 0$
$\therefore D_g = \{x \in \mathbb{R} ; x \neq -4\}$

c.) $h(x) = \dfrac{x-2}{x^2-1}$ → $x^2 - 1 \neq 0$
$\therefore D_h = \{x \in \mathbb{R} ; x \neq -1, 1\}$

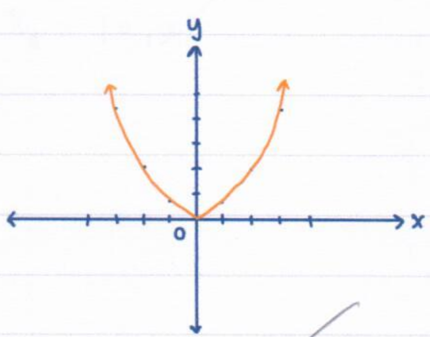
d.) $F(x) = \dfrac{x-1}{(x-2)(x-3)}$ → $x-2 \neq 0$, $x-3 \neq 0$
$\therefore D_F = \{x \in \mathbb{R} ; x \neq 2, 3\}$

e.) $G(x) = \sqrt{x-1}$ → $x - 1 \geq 0$
$\therefore D_G = [1, \infty)$

f.) $H(x) = \dfrac{1}{\sqrt{5x-2}}$ → $5x-2 > 0$
$\therefore D_H = (\frac{2}{5}, \infty)$

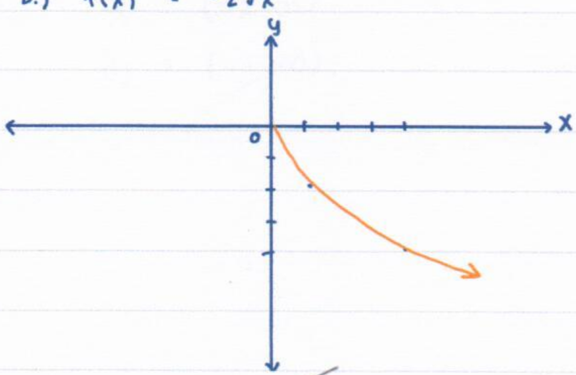
3. Sketch the graph of each function and find the domain and range

a.) $f(x) = 0.5x^2$



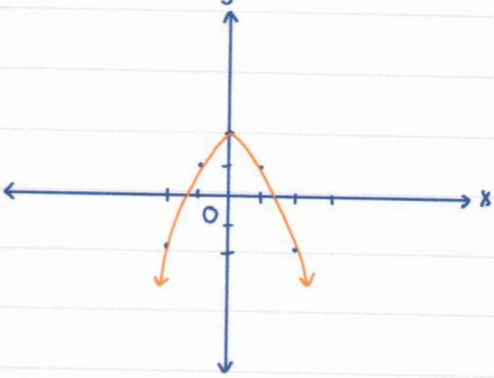
$D_f = \mathbb{R}$
$R_f = [0, \infty)$

b.) $f(x) = -2\sqrt{x}$



$D_f = [0, \infty)$
$R_f = (-\infty, 0]$

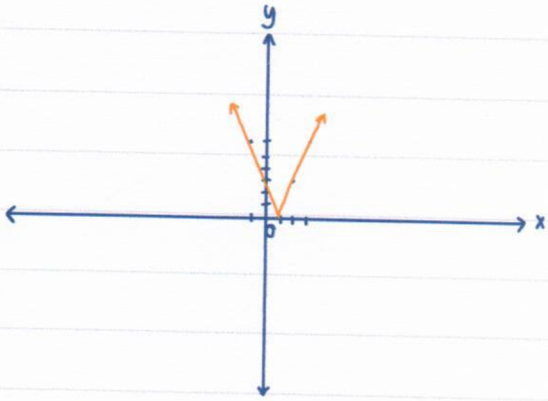
c.) $f(x) = -x^2+2$



$D_f = \mathbb{R}$

$R_f = (-\infty, 2]$

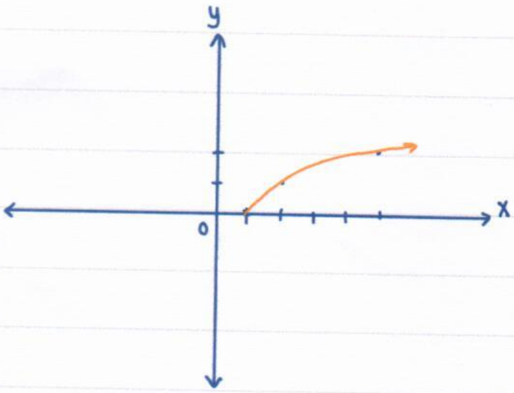
d.) $f(x) = 3|x-1|$



$D_f = \mathbb{R}$

$R_f = [3, \infty)$

e.) $G(x) = \sqrt{x-1}$ $\quad x-1 \geq 0$

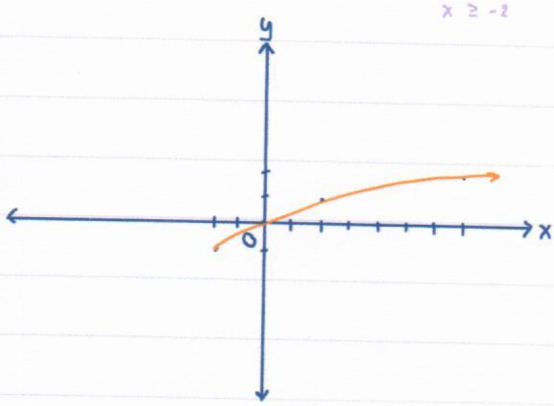


$D_G = [1, \infty)$

$R_G = [0, \infty)$

f.) $f(x) = \sqrt{x+2} - 1$ $\quad x+2 \geq 0$

$x \geq -2$



$D_f = [-2, \infty)$

$R_f = [-1, \infty)$

④ Find the domain and the vertical and horizontal asymptotes of each rational function.

a.) $f(x) = \dfrac{x^2+4x+5}{x^2-2x+1}$

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

- domain : $\mathbb{R} - \{1\}$
- horizontal : $y = 1$
- vertical : $x = 1$

b.) $f(x) = \dfrac{x^2-3x-4}{2x^2+4x}$

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

- domain : $R - \{-2, 0\}$
- horizontal : $y = \frac{1}{2}$
- vertical : $x = 0, -2$

c.) $f(x) = \dfrac{x^2-3x+2}{x^2-4x+3}$

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

- domain : $R - \{1, 3\}$
- herizontal : $y = 1$
- vertical : $x = 3$

d.) $f(x) = \dfrac{x+2}{x^2-4x+3}$

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

- domain : $R - \{1, 3\}$
- horizontal : $y = 0$ $\lim_{x\to\infty} f(x) = 0$
- vertical : $x = 1, 3$

e.) $f(x) = \dfrac{x^2-3x-4}{x^3+x}$

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

- domain : $R - \{0\}$
- horizontal : $y = 0$
- vertical : $x = 0$

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

$= \dfrac{(x-2)\cancel{(x-1)}}{\cancel{(x-1)}}$

- domain : $R - \{1\}$
- horizontal : none
- vertical : none

⑤ Solve eash equation for x

a.) $7^x = 7^{2x+3}$

$x = 2x+3$

$x = -3$

b.) $\frac{2^{2x}}{2^5} = 2^x$

$2x - 5 = x$

$x = 5$

c.) $5^3 = (x+4)^3$

$5 = x+4$

$x = 1$

d.) $3^x 3^{2x-1} = 3^8$

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

$3x = 9$

$x = 3$

⑥ Let In a = 5 and In b = 2, find

a.) $\ln[(a^3)\sqrt{b}]$

$= \ln a^3 + \ln\sqrt{b}$

$= 3\ln a + \ln b^{\frac{1}{2}}$

$= 3\ln a + \frac{1}{2}\ln b$

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

$= 15 + 1$

$= 16$

b.) $\ln \frac{a^2}{b^2}$

$= \ln a^2 - \ln b^2$

$= 2\ln a - 2\ln b$

$= 2(5) - 2(2)$

$= 10 - 4$

$= 6$

c.) $\ln(3^{2\log_3 b})$

$= \ln(3^{\log_3 b} \times 3^{\log_3 b})$

$= \ln 3^{\log_3 b} + \ln_3 {}^{\log_3 b}$

$= \ln b + \ln b$

$= 2 + 2$

$= 4$

d.) $\ln \frac{eb^2}{a^3}$

$= \ln eb^2 - \ln a^3$

$= \ln e + \ln b^2 - \ln a^3$

$= \ln e + 2\ln b - 3\ln a$

$= 1 + 2(2) - 3(5)$

$= 5 - 15$

$= 10$