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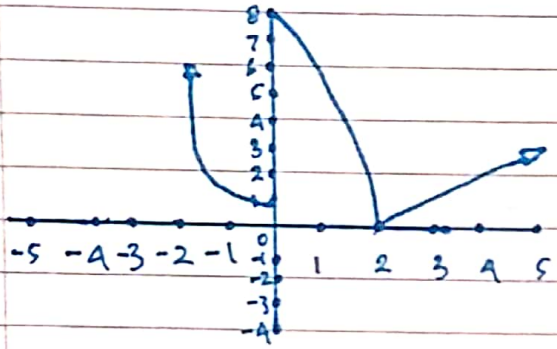
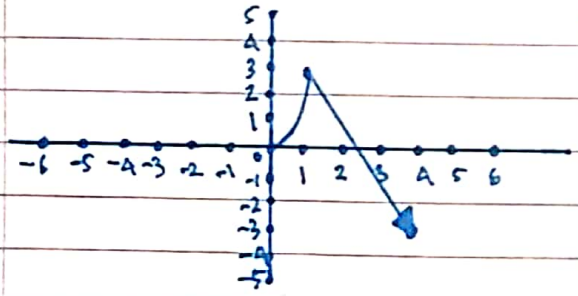
Deskripsi : Tugas Fungsi & Grafik

1. $$f(x)\begin{cases} x^2+1, & x<0 \\ 8-2x^2, & 0 \le x \le 2 \\ x-2, & x \ge 2 \end{cases}$$



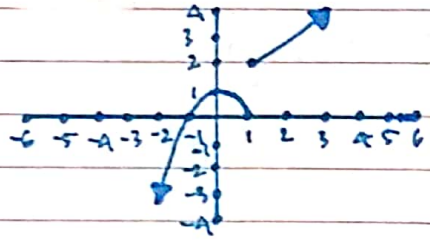
$D_f = (-\infty, 0) \cup [0, 2) \cup [2, \infty)$
$= (-\infty, \infty)$
$R_f = (1, \infty) \cup [8, 0) \cup [0, \infty)$
$= [0, \infty)$

2. $$f(x)\begin{cases} 0, & x<0 \\ 3x^2, & 0 \le x \le 1 \\ -2x+5, & x>1 \end{cases}$$



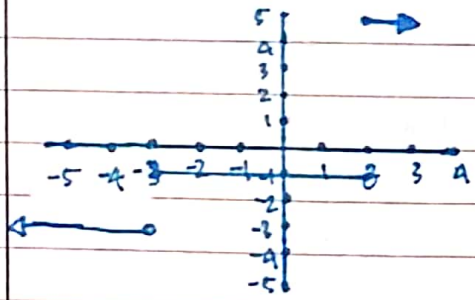
$D_f = (-\infty, 0) \cup [0, 1] \cup (1, \infty)$
$= (-\infty, \infty)$
$R_f = 0 \cup [0, 3] \cup (-\infty, 3)$
$= (-\infty, 3]$

3. $$f(x)\begin{cases} 1-x^2, & x<1 \\ 1+x, & x \ge 1 \end{cases}$$



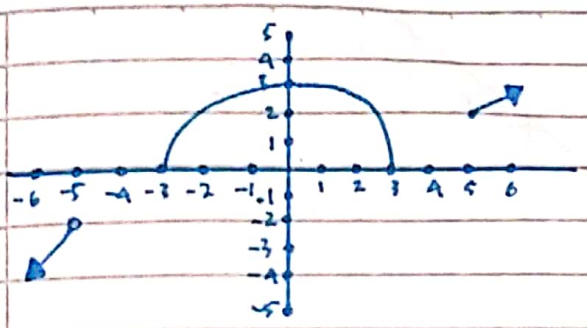
$D_f = (-\infty, 1) \cup [1, \infty)$
$= (-\infty, \infty)$
$R_f = (-\infty, 1] \cup [2, \infty)$

4. $$f(x)\begin{cases} -3, & x<-3 \\ -1, & -3 \le x < 2 \\ 5, & x \ge 2 \end{cases}$$



$D_f = (-\infty, -3) \cup [-3, 2) \cup [2, \infty)$
$= (-\infty, \infty)$
$R_f = \{-3, -1, 5\}$

5. $$f(x)\begin{cases} x+3, & x<-5 \\ \sqrt{9-x^2}, & -5 \le x < 5 \\ x-3, & x \ge 5 \end{cases}$$



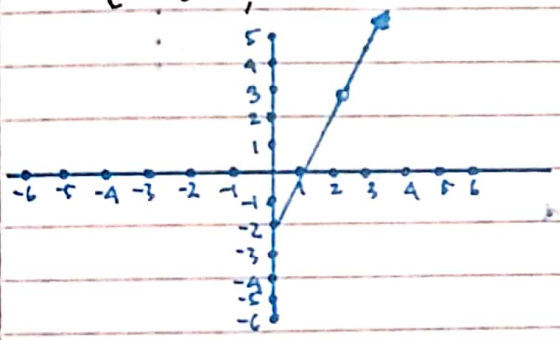
$D_f = (-\infty, -5) \cup [-5, 5) \cup [5, \infty)$

$= (-\infty, \infty)$

$R_f = (-\infty, -2) \cup [0, 3] \cup [2, \infty)$

$= (-\infty, -2) \cup [0, \infty)$

6. $f(x) = \begin{cases} 2x-1, & x \neq 2 \\ 0, & x = 2 \end{cases}$



$D_f = \{x \neq 2\} \cup \{x = 2\}$

$= \{x \in R\}$

$= (-\infty, \infty)$

$R_f = \{y \neq 3\} \cup \{y = 0\}$

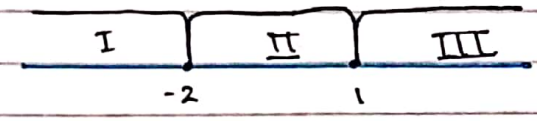
$= \{y \in R, y \neq 3\}$

$= (-\infty, 3) \cup (3, \infty)$

7. $f(x) = |x+2| + 2|x-1|$

$|x+2| \begin{cases} x+2, & x \geq -2 \\ -(x+2), & x < -2 \end{cases}$

$|x-1| \begin{cases} x-1, & x \geq 1 \\ -(x-1), & x < 1 \end{cases}$



I. $x < -2$

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

$= -x - 2 - 2x + 1$

$= -3x$

II. $-2 \leq x < 1$

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

$= x + 2 - 2x + 2$

$= -x + 4$

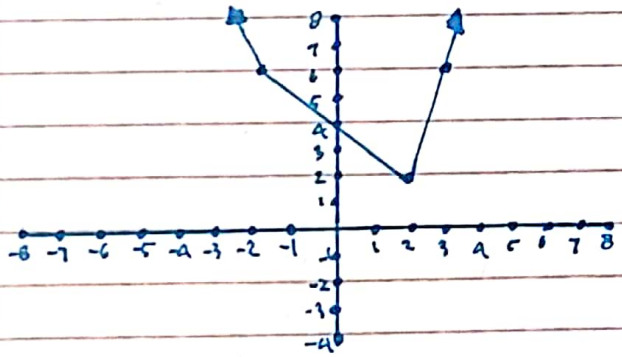
III. $x \geq 1$

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

$= x + 2 + 2x - 2$

$= 3x$

$f(x) \begin{cases} -3x, & x < -2 \\ -x+4, & -2 \leq x < 1 \\ 3x, & x \geq 1 \end{cases}$



$D_f = (-\infty, -2) \cup [-2, 1) \cup [1, \infty)$

$= (-\infty, \infty)$

$R_f = (6, \infty) \cup (3, 6] \cup [3, \infty)$

$= [3, \infty)$

8. $F(x) = 5 - |x-2|$

$|x-2| \begin{cases} x-2, & x \geq 2 \\ -(x-2), & x < 2 \end{cases}$

▷ $x \geq 2$

$F(x) = 5 - (x-2)$

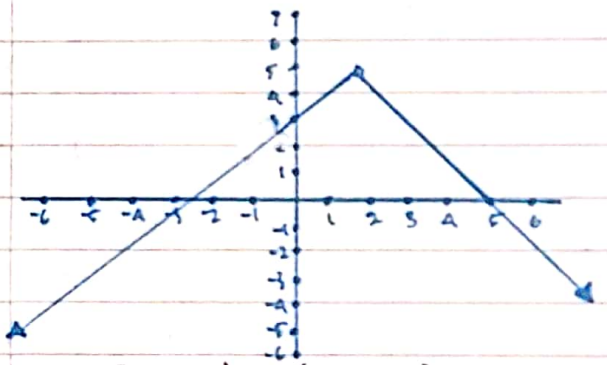
$= -x + 7$

▷ $x < 2$

$F(x) = 5 + (x-2)$

$= x + 3$

$F(x) \begin{cases} -x+7, & x \geq 2 \\ x+3, & x < 2 \end{cases}$



$D_F = [2, \infty) \cup (-\infty, 2)$

$= (-\infty, \infty)$

$R_F = (-\infty, 5] \cup (-\infty, 5)$

$= (-\infty, 5]$

9. $F(x) = \dfrac{|x|}{2x}$

$|x| \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

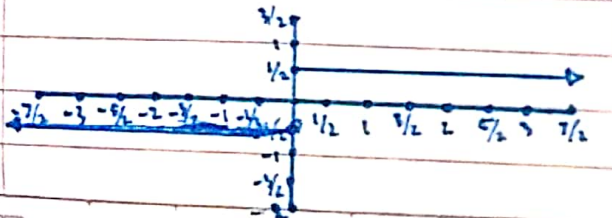
▷ $x \geq 0$

$F(x) = \dfrac{x}{2x}$

▷ $x < 0$

$F(x) = \dfrac{-x}{2x}$

$F(x) \begin{cases} \frac{1}{2}, & x \geq 0 \\ -\frac{1}{2}, & x < 0 \end{cases}$



$D_F = (-\infty, \infty)$

$R_F = \{-\frac{1}{2}, \frac{1}{2}\}$

10. $F(x) = x^2 - 2|x|$

$|x| \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

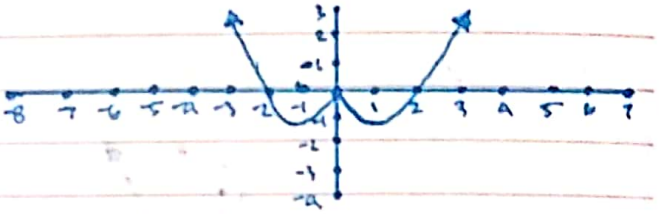
▷ $x \geq 0$

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

▷ $x < 0$

$F(x) = x^2 + 2x$

$F(x) \begin{cases} x^2-2x, & x \geq 0 \\ x^2+2x, & x < 0 \end{cases}$



$D_F = (-\infty, \infty)$

$R_F = [-1, \infty)$

11. $F(x) = 3x + |3x-5|$

$|3x-5| \begin{cases} 3x-5, & x \geq \frac{5}{3} \\ -(3x-5), & x < \frac{5}{3} \end{cases}$

▷ $x \geq \frac{5}{3}$

$F(x) = 3x + (3x-5)$

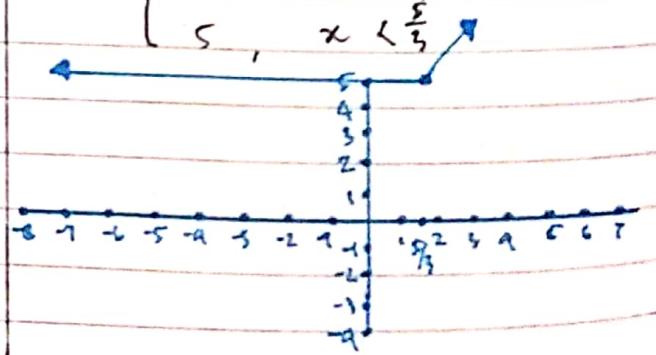
$= 6x - 5$

▷ $x < \frac{5}{3}$

$F(x) = 3x - (3x-5)$

$= 5$

$F(x) \begin{cases} 6x-5, & x \geq \frac{5}{3} \\ 5, & x < \frac{5}{3} \end{cases}$



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$D_f = (-\infty, \infty)$

$R_F = [5, \infty)$

12. $f(x) = 2 - \dfrac{x}{|x|}$

$|x| \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

▷ $x \geq 0$

$f(x) = 2 - \dfrac{x}{x}$

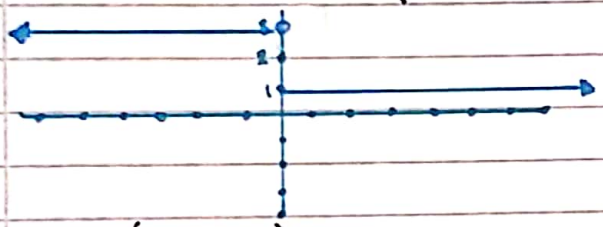
$= 2 - 1 = 1$

▷ $x < 0$

$f(x) = 2 + \dfrac{x}{x}$

$= 2 + 1 = 3$

$f(x) \begin{cases} 1, & x \geq 0 \\ 3, & x < 0 \end{cases}$



$D_f = (-\infty, \infty)$

$R_f = \{1, 3\}$

13. $f(x) = 2|x| - [\![x]\!]$

▷ $[\![x]\!]$

$n = -2 \quad -2 \leq x < -1$

$n = -1 \quad -1 \leq x < 0$

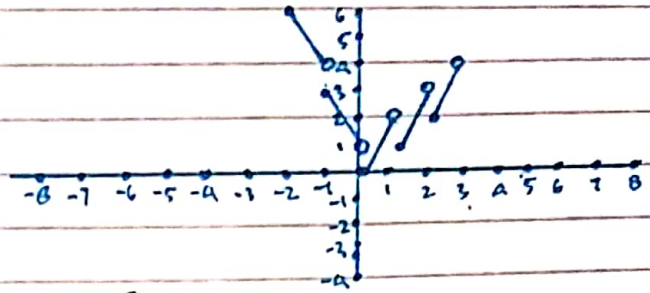
$n = 0 \quad 0 \leq x < 1$

$n = 1 \quad 1 \leq x < 2$

$n = 2 \quad 2 \leq x < 3$

▷

$$f(x) \begin{cases} -2x + 2, & -2 \leq x < -1 \\ -2x + 1, & -1 \leq x < 0 \\ 2x, & 0 \leq x < 1 \\ 2x - 1, & 1 \leq x < 2 \\ 2x - 2, & 2 \leq x < 3 \end{cases}$$



$D_F = [-2, 3)$

$R_F = [0, 4) \cup (4, 6)$

14. $f(x) = [\![x]\!] + 3|x + 1|$

▷ $[\![x]\!]$

$n = -2 \quad -2 \leq x < -1$

$n = -1 \quad -1 \leq x < 0$

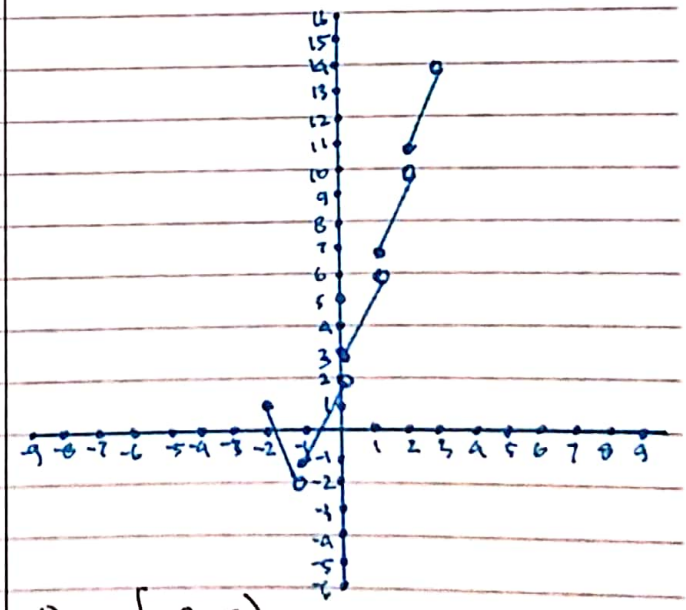
$n = 0 \quad 0 \leq x < 1$

$n = 1 \quad 1 \leq x < 2$

$n = 2 \quad 2 \leq x < 3$

▷

$$f(x) \begin{cases} -3x - 5, & -2 \leq x < -1 \\ -3x - 4, & -1 \leq x < 0 \\ 3x + 3, & 0 \leq x < 1 \\ 3x + 4, & 1 \leq x < 2 \\ 3x + 5, & 2 \leq x < 3 \end{cases}$$



$D_F = [-2, 3)$

$R_F = (-2, 2) \cup [3, 6) \cup [7, 10) \cup [11, 14)$