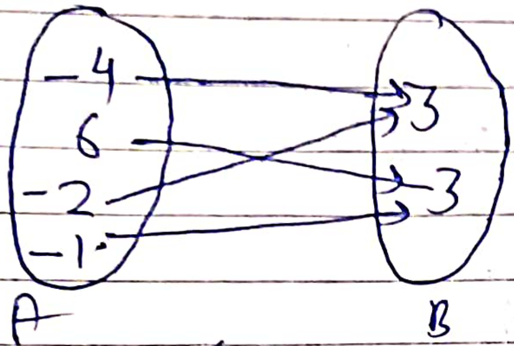
1.2.3

1. $\{(-4,3), (6,-3), (-2,3), (-1,-3)\} = R$



Relation $(R) \subseteq A \times B$

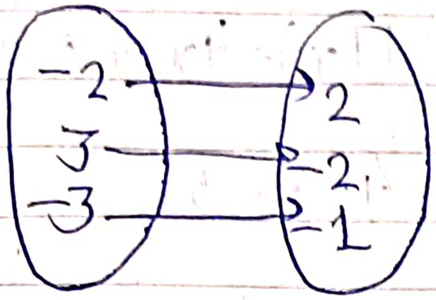
if $A = \{-4, 6, -2, -1\}$
$B = \{-3, 3\}$

$A \times B = \{(-4,-3), (-4,3), (6,-3), (6,3), (-2,-3), (-2,3), (-1,-3), (-1,3)\}$

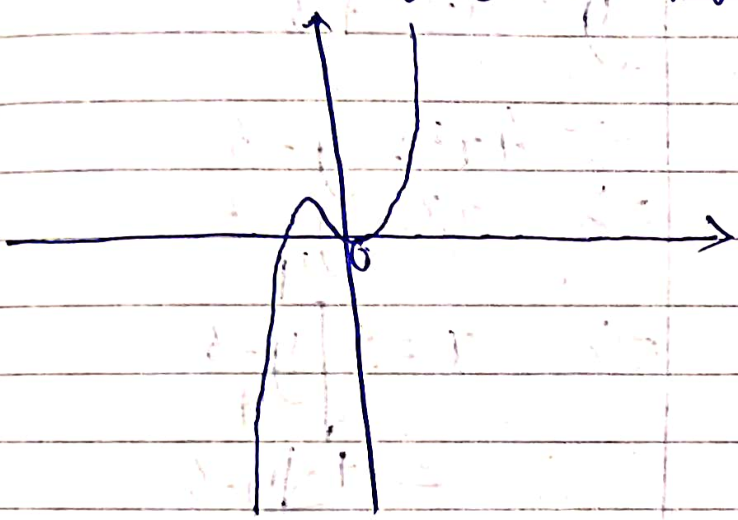
clearly $R \subseteq A \times B$

Hence, R is a relation.

2. $R = \{(-2,2),(3,-2),(-3,-1)\}$

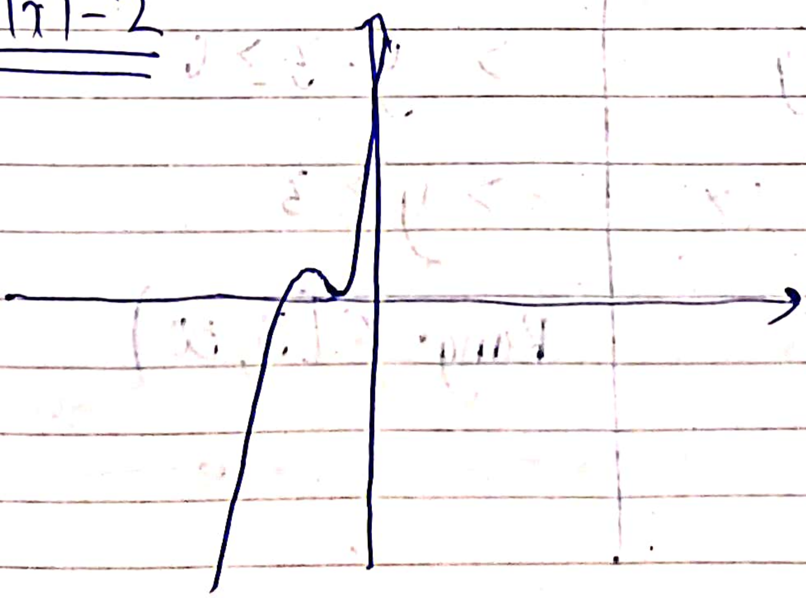


3. If the following graph of $f(x)$



$f(x)-2$

(b)



5. $y = \frac{x-1}{x+2}$

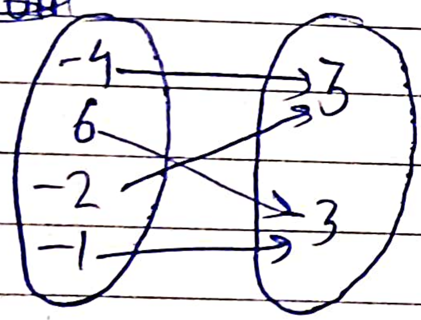
for domain (D): $x+2 > 0$

$\Rightarrow x > -2$

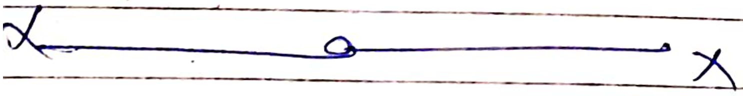
domain (D): $(-2, \infty)$

6. $f(x) = [(-4,3),(6,-3),(-2,3),(-1,-3)]$

~~dom~~



Domain $(f(x))$: $\{-4,6,-2,-1\}$



7. range of function $f(x) = 4x^2+3$?

$y = 4x^2+3$

x in terms of y

$y = 4x^2+3$

$\Rightarrow 4x^2 = y-3$

$\Rightarrow x^2 = \frac{y-3}{4}$

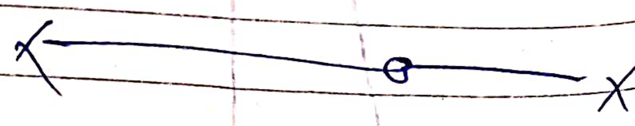
$\Rightarrow x = \pm\sqrt{\frac{y-3}{4}}$

$= \pm\frac{\sqrt{y-3}}{2}$

$\Rightarrow y-3 \geq 0$

$\Rightarrow y \geq 3$

Range $\in [3, \infty)$



Date
Page

8. If $f(x) = 2x^3 - 5x + 3$

$g(x) = 3x^2 - 9$,

find $f(x) + g(x)$

$f(x) + g(x) = 2x^3 - 5x + 3 + 3x^2 - 9$

$= 2x^3 + 3x^2 - 5x - 6$

9. If $f(x) = 3x^3 + 2x^2 - 5x + 2$

~~g(x) = 3x^2 - 9~~

$g(x) = -x^3 - x^2 + 5$

find $f(x) - g(x)$

$f(x) - g(x) = 3x^3 + 2x^2 - 5x + 2 - (-x^3 - x^2 + 5)$

$= 3x^3 + 2x^2 - 5x + 2 + x^3 + x^2 - 5$

$= 4x^3 + 3x^2 - 5x + 2 - 5$

$= 4x^3 + 3x^2 - 5x - 3$

10. If $f(x) = 6x^4$ and $g(x) = 3x$

$\frac{g(x)}{f(x)} = \frac{3x}{6x^4}$

$= \frac{1}{2x^3}$

Date
Page

11. $f(x) = -2x^2 + 3x - 4$
$g(x) = 3x^2 - 6$

$f(x).g(x)$

$= (-2x^2 + 3x - 4) \times (3x^2 - 6)$

$= -6x^4 + 12x^2 + 9x^3 - 18x - 12x^2 + 24$

$= -6x^4 + 9x^3 - 18x + 24$

12. $f(x) = 2x^2 - x$
$g(x) = 3x - 1$

$f(g(x)) = 2(3x-1)^2 - (3x-1)$

$= 2[9x^2 + 1 - 6x] - 3x + 1$

$= 18x^2 + 2 - 12x - 3x + 1$

$= 18x^2 - 15x + 3$

13. $f(x) = 4x^2.$
$g(x) = x^3 + 7x^2 - x + 1$

$g(f(x)) = (4x^2)^3 + 7(4x^2)^2 - 4x^2 + 1$

$= 64x^5 + 112x^4 - 4x^2 + 1$

14. $f(x) = 4x$

$y = 4x$
$\Rightarrow x = \frac{y}{4}$

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

15. $g(x) = \frac{3}{x}$

$y = \frac{3}{x} \Rightarrow x = \frac{3}{y}$

$f^{-1}(x) = \left(\frac{3}{x}\right)$