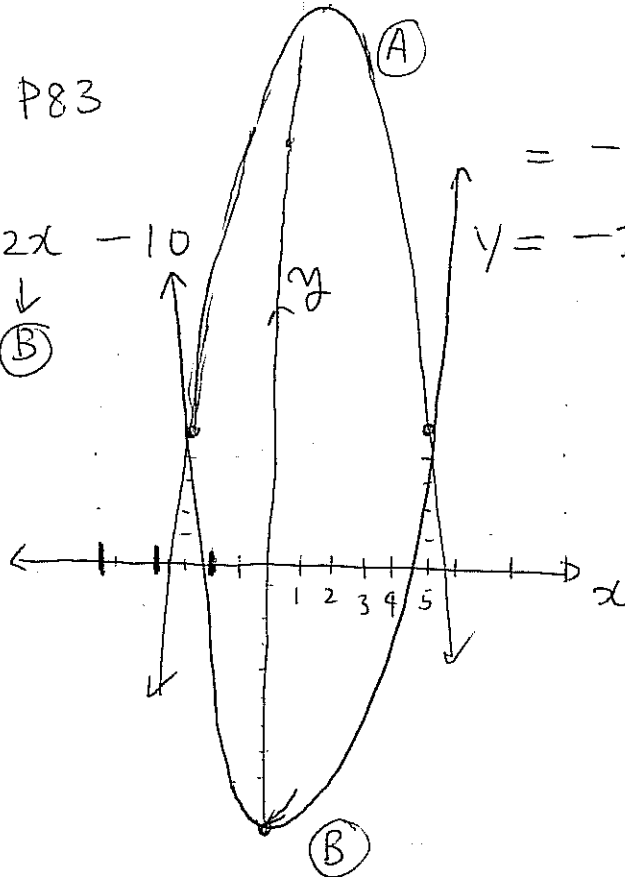


Feb 17 HW P83

(C1) $y = x^2 - 2x - 10$

(B)



$$= -(x^2 - 2x - 20)$$

$y = -x^2 + 2x + 20$ (A)

* If you check only few points of two functions, you might come up with wrong conclusion. You must simplify both equations and restrictions at the same time.

(C2) $\frac{x^2 + 6x + 3}{6x + 3} = \frac{x^2 + \cancel{6x} + \cancel{3}}{\cancel{6x} + \cancel{3}} = x^2$

One can not cancel the terms in numerator and denominator, if there are more than one term in denominator or numerator.

(C3) $4x^3 + 4x^2 - 5x + 3$
 $= x(4x^2 + 4x - 5) + 3$

y never becomes undefined in this function because this function does not contain any fraction.

3. a) $x \neq 3$

b) $x \neq -2$

4. a) $x \neq 5$

b) Denominator = $(x+3)(x+2)$

$x \neq -3, -2$

5. e) $f(x) = \frac{12x^2 - 5x - 2}{3x^2 - 2x} \xrightarrow{ac = -24, b = -5} \frac{12x^2 - 8x + 3x - 2}{x(3x-2)}$

$= \frac{4x(3x-2) + (3x-2)}{x(3x-2)}$

$= \frac{(4x+1)(3x-2)}{x(3x-2)} = \frac{4x+1}{x}, \quad \begin{matrix} x \neq 0 \\ x \neq \frac{2}{3} \end{matrix}$

6. b) $\frac{3(x-7)^2(x-10)}{x^2 - 17x + 70} = \frac{3(x-7)^2(x-10)}{(x-10)(x-7)}$

$= \frac{3(x-7)}{1} = 3x - 21, \quad x \neq 10, x \neq 7$

d) $\frac{x^2 + 7x - 18}{x^2 + 3x - 10} = \frac{(x+9)(x-2)}{(x+5)(x-2)}$

$= \frac{(x+9)}{(x+5)}, \quad x \neq -5, x \neq 2$

f) $\frac{25x^2 + 10x - 8}{10x^2 + 26x - 12} \xrightarrow{ac = -200, b = 10} \frac{25x^2 + 20x - 10x - 8}{2(5x^2 + 13x - 6)}$

$ac = -30$

$= \frac{5x(5x-2) + 4(5x-2)}{2(5x^2 + 15x - 2x - 6)} = \frac{(5x+4)(5x-2)}{2[5x(x+3) - 2(x+3)]}$

15x(-2)

$$6f) \frac{(5x+4)(5x-2)}{2(x+3)(5x-2)}$$

$$= \frac{(5x+4)}{2(x+3)} = \frac{5x+4}{2x+6}, x \neq -3, x \neq \frac{2}{5}$$

$$8. A = \pi r^2 - \pi \times 3^2$$

$$a) A = \pi r^2 - 9\pi \quad a=r$$

$$A = \pi(r^2 - 9) = \pi(r^2 - 3^2) \quad b=3$$

$$A = \pi(r+3)(r-3)$$

$$b) \text{ domain } \{r \in \mathbb{R}, r > 3\} \quad * \text{ if } r=3, \rightarrow A=0 \text{ so } r > 3$$

$$\text{Range } \{A \in \mathbb{R}, A > 0\} \quad * \text{ since } r=3, \text{ Area must be greater than } 0.$$

$$9. a) \text{ Volume} = L \times W \times H$$

$$= (2x+0.5)(x-0.5)(x+0.5)$$

$$b) SA = 2(2x+0.5)(x-0.5) + 2(2x+0.5)(x+0.5) + 2(x-0.5)(x+0.5)$$

$$c) 0.625 \text{ m}^3, 6.625 \text{ m}^2; 1.875 \text{ m}^3, 11.5 \text{ m}^2; 7 \text{ m}^3, 25 \text{ m}^2$$

$$d) V(x) : \text{ domain } \{x \in \mathbb{R}, x > 0.5\},$$

$$\text{Range } \{V \in \mathbb{R}, V > 0\};$$

$$SA(x) : \text{ domain } \{x \in \mathbb{R}, x > 0.5\},$$

$$\text{Range } \{SA \in \mathbb{R}, SA > 3\}$$

* We will learn domain and range more
in depth this week. Do not worry about
domain and range questions ~~at this~~ yet.