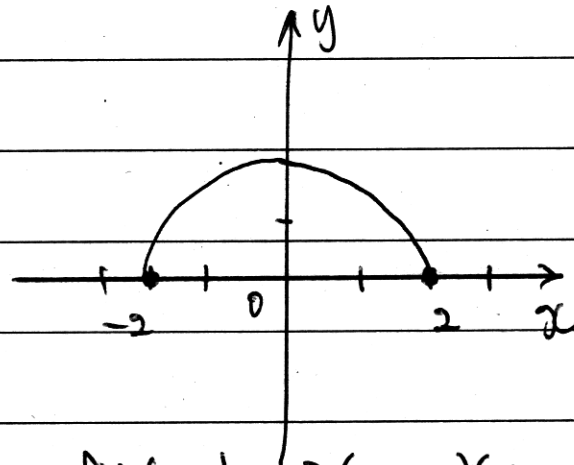
BOARD OF STUDIES
NEW SOUTH WALES

Question 6

a.) range : $0 \leq y \leq 2$



b). $f'(x) = 3(x+1)(x-3)$. (0, 12)

i) $f'(x) = 3(x^2 - 2x - 3)$

$= 3x^2 - 6x - 9$

$f''(x) = \frac{6x^3}{3} - \frac{6x^2}{2} - 9x$

$= 2x^3 - 3x^2 - 9x$

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

$= (2x^2 - 3x)(x-3)$

$= x(2x-3)(x-3)$

~~$12 = 0(2(0)-3)(0-3)$~~

~~$= 0 - 3 \times -3$~~

~~$= 9$~~

$x =$

$2x = 3$

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

$x = 0$ $y = 0$

$y = 0$ $2x^3 - 3x^2 - 9x = 0$

$x = 0, \frac{3}{2}, x = 3.$

BOARD OF STUDIES
NEW SOUTH WALES

(ii)

(iii)

BOARD OF STUDIES
NEW SOUTH WALES

Question 6.

c) ~~$V = \pi \int_a^b (F(x))^2$~~

$V = (4\pi \times 4)\frac{3}{4}$ ∴ The volume of the bowl is

$= 37.699$ 37.7 ~~cm~~ $unit^3$.