St. Margaret's Secondary School

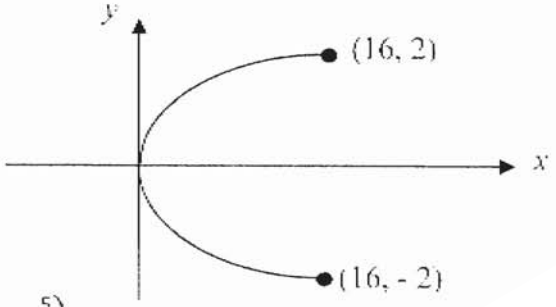
Sec 4E5N Preliminary Examinations

Additional Mathematics Paper 1

1. $\frac{dy}{dx} = \frac{7}{(x+2)^2}$, the curve has no turning point.

2. $x = -2 + \sqrt{6}$, $a = -2, b = 6$

3(i)



3(ii) (4, 1), $\left(\frac{25}{16}, -\frac{5}{8}\right)$

4(i) acceleration = -8 m/s^2 (ii) time = 48 s

5. $f(x) = 3x^2 - x^3 - x + 6$

6(i) $\frac{1}{d}$ (ii) $\frac{6}{d}$ (iii) $\frac{5d}{6+d^2}$; $d = 2$ or 3

7. $2x^2 - 4\sqrt{5}x + 7 = 0$

8(i)

$$2x+1 \;\overline{)\; 2x^3 - 11x^2 + 12x + 9}$$

$$x^2 - 6x + 9$$

(ii) $\frac{5}{(2x+1)} + \frac{4}{(x-3)} - \frac{1}{(x-3)^2}$

9. $\frac{4}{3}$ units^2

10 (ii) $x = \frac{3}{4}\pi, \frac{7}{4}\pi, -\frac{\pi}{4}, -\frac{5}{4}\pi$

12(iii) $x = -3$ (rej) or 1; $x = 1$, $\frac{d^2y}{dx^2} < 0$, $\therefore$ max point;

Volume of cone = 33.5 cm^3; least volume of solid left = 79.6 cm^3

13(i) radius = 5 units; Centre(4, -1) (ii) $x^2 + y^2 - 8x + 2y - 8 = 0$

(iii) $y = 4$ & $y = -6$ (iv) $(x-8)^2 + (y-2)^2 = \frac{25}{4}$