NO: ............ ADIL AR-RAYYAN 3KI DATE:

ADD MATHS FINAL ASSESSMENT

1) a) $v = -t^2 + 6t - 5$

$s = \int v \, dt$

$s = \int (-t^2 + 6t - 5) \, dt$

$= -\frac{1}{3}t^3 + 3t^2 - 5t + c$

when $t = 0$, $s = 0$,

$0 = -\frac{1}{3}(0)^3 + 3(0)^2 - 5(0) + c$

$c = 0$

when $v = 12$,

$-12 = t^2 - 6t + 5$

$-t^2 + 6t + 7 = 0$

$t^2 - 6t - 7 = 0$

$t = -1$ or $t = 7$

(rejected)

$s = -\frac{1}{3}(7)^3 + 3(7)^2 - 5(7)$

$= -\frac{7}{3}$

1) b) $-t^2 + 6t - 5 = 0$

$(-t + 5)(t - 1) = 0$

$t = 5$ or $t = 1$

$\frac{dv}{dt} = -2t + 6$

when $t = 5$, $-2(5) + 6 = -4$

when $t = 1$, $-2(1) + 6 = 4$

max displacement is when $t = 5$

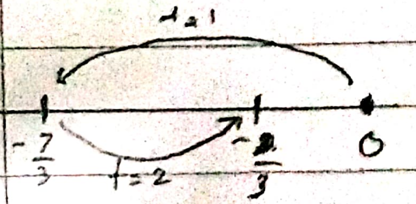
$s = -\frac{1}{3}(5)^3 + 3(5)^2 - 5(5)$

$= \frac{25}{3}$

1) c) when $t = 0$, $s = 0$

when $t = 1$, $s = -\frac{1}{3}(1)^3 + 3(1)^2 - 5(1) = -\frac{7}{3}$

when $t = 2$, $s = -\frac{1}{3}(2)^3 + 3(2)^2 - 5(2) = -\frac{2}{3}$




at $t = 1$ the particle moves $\frac{7}{3}$ units to the negative direction

at $t = 2$ the particle moves $\frac{5}{3}$ units to the positive direction

$\therefore$ total distance $= \frac{7}{3} + \frac{5}{3} = 4$ units

2) a) $EF = 90$

$V_P = 10 + 8t - 2t^2$

$V_Q = -3$

$\frac{dv}{dt} = 0$

$8 - 4t = 0$

$t = 2$

$V_P = 10 + 8(2) - 2(2)^2$

$= 18$

NO:

DATE:

2)b) $s = \int (10 + 8t - 2t^2)\, dt$

$s = \int 10t + 4t^2 - \frac{2}{3}t^3 + c$

when $t = 0$ and $s = 0$, $c = 0$

$s = 10t + 4t^2 - \frac{2}{3}t^3$

$10 + 8t - 2t^2 = 0$

$t^2 - 4t - 5 = 0$

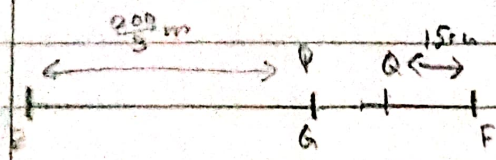
$(t-1)(t-5) = 0$

$t = -1$ or $t = 5$
(rejected)

$s = 10(5) + 4(5)^2 - \frac{2}{3}(5)^3$

$= \frac{200}{3}$

c) when $t = 5$, $s = (-3)(5)$




$PQ = 90 - \frac{200}{3} - 15$

$= \frac{25}{3}$

3)a) (I) $20x + 15y \leq 2400$

(II) $10x + 17.5y \geq 1400$

(III) $x > \frac{3}{2}y$

ii) 90

c) i) $34 \leq y \leq 53$

ii) $60x + 30y = P$

when $x = 80$ and $y = 53$,

$60(80) + 30(53) = P$

$P = 6390$

When $x = 65$ and $y = 43$

$60(65) + 30(43) = P$

$P = 5190$

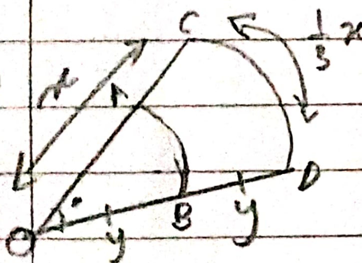
when $x = 105$, and $y = 20$

$60(120) + 30(20) = P$

$P = 6900$

$\therefore$ max profit = RM6,900

4)a)




$2y = x$

$s = r\theta$

$\frac{1}{3}x = x\theta$

$\frac{\frac{1}{3}x}{x} = \theta$

$\theta = \frac{1}{3}$

b) $s = r\theta$

$= 4(\frac{1}{3})$

$= \frac{4}{3}$

c) $A_{full} = \frac{1}{2}(4^2)(\frac{1}{3})$

$= \frac{8}{3}$

$A_{not\ shaded} = \frac{1}{2}(2^2)(\frac{1}{3})$

$= \frac{2}{3}$

$A_{shaded} = \frac{8}{3} - \frac{2}{3}$

$= 2\text{ cm}^2$