

1. POI = ?

c) $y = \frac{1}{2}x^2 - 2x - 3$ (B) and $y = -3x + 1$ (A)

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

$$0 = \frac{1}{2}x^2 - 2x + 3x - 3 - 1$$

$$0 = \frac{1}{2}x^2 + x - 4$$

$\times 2$ $\times 2$ $\times 2$ $\times 2$

$$0 = x^2 + 2x - 8 \quad ac = -8$$

$$0 = (x+4)(x-2) \quad b = 2$$

$$\therefore x = -4, 2$$

$$4 \times (-2) = -8$$

* when $x = -4 \rightarrow y = -3(-4) + 1$

$$y = 13 \rightarrow (-4, 13)$$

* when $x = 2 \rightarrow y = -3(2) + 1$

$$y = -5 \rightarrow (2, -5)$$

\therefore Two POI are

$(-4, 13)$ and $(2, -5)$

d) $y = -2x^2 - 7x + 10$ and $y = -x + 2$

$$-x + 2 = -2x^2 - 7x + 10$$

$$0 = -2x^2 - 7x + x + 10 - 2$$

$$0 = -2x^2 - 6x + 8$$

$\div -2$ $\div -2$ $\div -2$ $\div -2$

$$0 = x^2 + 3x - 4$$

$$0 = (x+4)(x-1)$$

$$x = -4, +1$$

$$ac = -4$$

$$b = +3$$

$$4 \times -1 = -4$$

$$4 + -1 = +3$$

* when $x = -4 \rightarrow y = -(-4) + 2 = 6$

$$(-4, 6)$$

* when $x = +1 \rightarrow y = -(1) + 2 = 1$

$$(1, 1)$$

\therefore Two POI are $(1, 1)$ and $(-4, 6)$

P67

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$$\#1 \text{ a) } y = x^2 - 7x + 15 \text{ (A) and } y = 2x - 5 \text{ (B)}$$

Sub (B) into (A)

$$2x - 5 = x^2 - 7x + 15$$

$$0 = x^2 - 7x - 2x + 15 + 5$$

$$0 = x^2 - 9x + 20$$

$$0 = (x-5)(x-4)$$

$$x = 5, 4$$

$$\text{When } x=5 \rightarrow y = 2(5) - 5 = 5$$

$$(5, 5)$$

$$\text{When } x=4 \rightarrow y = 2(4) - 5 = 3$$

$$(4, 3)$$

\therefore Two POI are

$$(5, 5) \text{ and } (4, 3)$$

$$\text{b) } y = 3x^2 - 16x + 37 \text{ (A) and } y = 8x + 1 \text{ (B)}$$

$$8x + 1 = 3x^2 - 16x + 37$$

$$0 = 3x^2 - 16x - 8x + 37 - 1$$

$$0 = 3x^2 - 24x + 36$$

$$\div 3 \quad \div 3 \quad \div 3 \quad \div 3$$

$$0 = x^2 - 8x + 12 \quad ac = 12$$

$$0 = (x-6)(x-2) \quad b = -8$$

$$-6 \times -2 = 12$$

$$x = 6, 2$$

$$\begin{aligned} * \text{ When } x=6 &\rightarrow y = 8(6) + 1 \\ &= 49 \rightarrow (6, 49) \end{aligned}$$

$$\begin{aligned} * \text{ When } x=2 &\rightarrow y = 8(2) + 1 = 17 \\ &\rightarrow (2, 17) \end{aligned}$$

\therefore Two POI are
(6, 49) and

$$(2, 17)$$