

HW 6I: 1cd, 3cd

1c.) $y = x^2 - 2x + 8 \neq y = x + 6$

$$\begin{array}{r} x^2 - 2x + 8 = x + 6 \\ -x \quad -6 \quad +x \quad +6 \\ \hline x^2 - 3x + 2 = 0 \end{array}$$

$$(x-2)(x-1) = 0$$

$$\therefore x = 2, \quad x = 1$$

$$\begin{array}{l} y = 2 + 6 \\ y = 8 \end{array}$$

$$\begin{array}{l} y = 1 + 6 \\ y = 7 \end{array}$$

$$\therefore \boxed{(2, 8)}$$

$$\therefore \boxed{(1, 7)}$$

1d.) $y = -x^2 + 3x + 9 \neq y = 2x - 3 \Rightarrow 2x - 3 = -x^2 + 3x + 9$

$$\begin{array}{l} y = 2(4) - 3 \\ y = 8 - 3 \\ y = 5 \end{array}$$

$$\therefore \boxed{(4, 5)}$$

$$\begin{array}{l} y = 2(-3) - 3 \\ y = -6 - 3 \\ y = -9 \end{array}$$

$$\boxed{(-3, -9)}$$

$$\begin{array}{l} +x^2 - 3x - 9 + x^2 - 3x - 9 \\ \therefore x^2 - x - 12 = 0 \end{array}$$

$$(x-4)(x+3) = 0$$

$$x = 4, \quad x = -3$$

$$\begin{array}{r} -12 \\ -4 \quad 3 \\ \hline -1 \end{array}$$

$$3c.) y = x^2 - 4x + 9 \neq y = -x^2 + 8x - 12$$

$$\begin{array}{r} x^2 - 4x + 9 = -x^2 + 8x - 12 \\ +x^2 - 8x + 12 \quad +x^2 - 8x + 12 \end{array}$$

$$\Rightarrow 2x^2 - 12x + 21 = 0$$

$$\begin{array}{r} 42 \\ \times \\ -12 \end{array}$$

doesn't factor

$$\text{discriminant: } b^2 - 4ac \Rightarrow (-12)^2 - 4(2)(21)$$

→ negative discriminant

means imaginary solutions

(aka no real solutions)

∴ no intersection

$$= 144 - 168$$

$$= -24$$

$$3d.) y = -2x^2 - 3x + 15 \neq y = -x^2 + 5$$

$$\begin{array}{r} -2x^2 - 3x + 15 = -x^2 + 5 \\ +2x^2 + 3x - 15 \quad +2x^2 - 15 + 3x \end{array}$$

$$0 = x^2 + 3x - 10$$

$$0 = (x+5)(x-2)$$

$$x = -5$$

$$x = 2$$

$$\boxed{(-5, 20)}$$

$$\boxed{(2, 1)}$$

$$\begin{array}{r} -10 \\ \times \\ 5 \quad -2 \\ 3 \end{array}$$

$$y = -(-5)^2 + 5$$

$$= -(25) + 5$$

$$= -25 + 5$$

$$= -20$$

$$y = -(2)^2 + 5$$

$$= -4 + 5$$

$$= 1$$