

الف =

$$y = x^2 + 9x + 5$$

ب:

Min

$$\begin{aligned} \frac{-b}{2a} &\rightarrow \frac{-9}{2} = -\frac{9}{2} \\ \frac{-\Delta}{4a} &\rightarrow \frac{-(81-20)}{4} = \frac{-61}{4} = -\frac{61}{4} \end{aligned}$$

الف =

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

ب:

Max

$$\begin{aligned} \frac{-b}{2a} &= \frac{-4}{-2} = 2 \\ \frac{-\Delta}{4a} &= \frac{-(16-12)}{-4} = \frac{-4}{-4} = 1 \end{aligned}$$

ج:

$$0 = -x^2 + 4x - 3 \rightarrow \Delta = b^2 - 4ac \rightarrow 16 - 12 = 4$$

د:

$$x_1 = \frac{-b + \sqrt{\Delta}}{2a} = \frac{-4 + 2}{-2} = 1$$

$$x_2 = \frac{-b - \sqrt{\Delta}}{2a} = \frac{-4 - 2}{-2} = 3$$

الف:

$$2x^2 - 3x + a = 0 \rightarrow \Delta > 0 \rightarrow b^2 - 4ac > 0 \rightarrow 9 - 12a > 0$$

ب:

$$9 > 12a \rightarrow \frac{9}{12} > a \rightarrow \frac{3}{4} > a$$

ج:

$$\Delta < 0 \rightarrow 9 - 12a < 0 \rightarrow a > \frac{3}{4}$$

د:

$$\Delta = 0 \rightarrow 9 - 12a = 0 \rightarrow a = \frac{3}{4}$$

الف:

$$x^2 - 2x - 1 = 0 \xrightarrow{+1} x^2 - 2x + 1 = 2 \rightarrow (x-1)^2 = 2$$

$$x-1 = \pm\sqrt{2} \rightarrow x = 1+\sqrt{2}, x = 1-\sqrt{2}$$

ب:

$$x^2 - x - 1 = 0 \xrightarrow{+\frac{1}{x}} \frac{x^2}{x} - \frac{x}{x} - \frac{1}{x} = \frac{1}{x} \rightarrow (x - \frac{1}{x})^2 = \frac{1}{x} + 1 \frac{5}{x}$$

$$x - \frac{1}{x} = \pm\sqrt{\frac{5}{x}} \rightarrow x_1 = \frac{1+\sqrt{5}}{2}, x_2 = \frac{1-\sqrt{5}}{2}$$

الف:

$$x^2 - 2x - 1 = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow 4 - (-4) = 8$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{2 \pm \sqrt{8}}{2} \rightarrow \frac{2 \pm 2\sqrt{2}}{2} \rightarrow 1 \pm \sqrt{2}$$

ب:

$$x^2 + x - 4 = 0 \rightarrow \Delta = 1 - (-16) = 17$$

$$x = \frac{-1 \pm \sqrt{17}}{2}$$

الف: $x^2 - 11x + 18 = 0 \rightarrow (x-4)(x-7) = 0$ $x = +4$ $x = +7$
 ب: $x^2 + 13x - 18 = 0 \rightarrow (x+18)(x-1) = 0$ $x = -18$ $x = +1$

الف: $\Delta x^2 - 12x + 7 = 0 \rightarrow x^2 - 12x + 36 = 0$
 $(x-6)(x-6) = 0 \rightarrow x = \frac{6}{1} = 6, x = \frac{-6}{1} = -6$
 ب: $3x^2 - 10x + 7 = 0 \rightarrow x^2 - 10x + 21 = 0$
 $(x-7)(x-3) = 0 \rightarrow x = \frac{7}{1} = 7, x = \frac{3}{1} = 3$

الف: $2x^2 - 5x + 3 = 0 \rightarrow a+b+c=0$ $x = \frac{c}{a} = \frac{3}{2}, x = 1$
 ب: $2x^2 + 5x + 3 = 0 \rightarrow a+c=b$ $x = \frac{-c}{a} = \frac{-3}{2}, x = -1$
 ج: $2x^2 - 5x + 1 = 0 \rightarrow \Delta = 25 - 8 = 17$ $x = \frac{5 \pm \sqrt{17}}{4}$
 د: $4x^2 + 7x + 9 = 0 \rightarrow \Delta = 49 - 144 = -95$ $x = \frac{-7 \pm \sqrt{95}}{8}$

$x^2 - 3x - 2 = 0$
 $S = \text{مجموع} = \frac{-b}{a} = \frac{3}{1} = 3$ $P = \text{ضرب} = \frac{c}{a} = \frac{-2}{1} = -2$
 $S^2 - 2P = \left(\frac{3}{1}\right)^2 - \left(\frac{-2}{1}\right) = 9 + 2 = 11$
 $S^3 - 3SP = 27 - \left(\frac{3}{1} \times \frac{-2}{1}\right) = 27 + 6 = 33$

الف: $\left(\frac{V}{\omega}\right) + \left(\frac{q}{\mu}\right) = \frac{V \times q \times \omega \times \mu}{\omega \times \mu \times \omega \times \mu} = \frac{K \mu}{\mu} = \mu \left(\frac{n}{k}\right) = \frac{n!}{k!(n-k)!}$
 $21 + \frac{9 \times 1}{\mu} = \frac{V \mu}{\mu} = \mu q \rightarrow \mu q + 21 = \omega V$
 ب: $\left(\frac{q}{\mu}\right) - \left(\frac{1}{\mu}\right) = \frac{\mu q \times \mu}{\mu \times \mu} - \frac{1 \times \mu}{\mu} = \mu q - 1 = \omega q$