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1 ii) $4x - 3y = 8 \quad \cdots (1)$

$y = \frac{4}{x} \quad \cdots (2)$

Sub (2) into (1)

$4x - 3\left(\frac{4}{x}\right) = 8$

$4x - \frac{12}{x} = 8$

x x throughout: $\frac{4x^2 - 12}{x} = \frac{8x}{x}$

$\therefore \quad 4x^2 - 12 = 8x$

$4x^2 - 8x - 12 = 0$

common factor 4. $x^2 - 2x - 3 = 0$

x	-3	$-3x$
x	$+1$	$+x$
x^2	-3	$-2x$

$(x-3)(x+1) = 0$

$x = 3$ or $x = -1$

$y = \frac{4}{3}$ or $y = -4$

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1 iii) $2x + 9y - 3 = 0 \quad \cdots (1)$

$xy + y + 2 = 0 \quad \cdots (2)$

Sub $x = \frac{3 - 9y}{2} \quad \cdots (3)$ into (2)

$\left(\frac{3-9y}{2}\right) y + y + 2 = 0$

$\frac{3y - 9y^2}{2} + \frac{y \times 2 + 2 \times 2}{\uparrow \times 2 \quad \uparrow \times 2} = 0$

$\frac{3y - 9y^2 + 2y + 4}{2} = 0$

switch: $3y - 9y^2 + 2y + 4 = 0$

$9y^2 - 5y - 4 = 0$

$9y$	$+4$	$+4y$
y	-1	$-9y$
$9y^2$	-4	$-5y$

$(9y + 4)(y - 1) = 0$

$y = -\frac{4}{9}$ or $y = 1$

$x = \frac{7}{2}$ # $x = -3$ #

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2.) $2ax + 4by = 16 \quad \cdots (1)$

$3ax - 5by = -17\frac{1}{4} \quad \cdots (2)$

Sub $x = 2$ and $y = 5$ into eqn (1) and (2)

$2a(2) + 4b(5) = 16$ $\qquad$ $3a(2) - 5b(5) = -17\frac{1}{4}$

$4a + 20b = 16$ $\qquad$ $6a - 25b = -17\frac{1}{4} \quad \cdots (4)$

$a + 5b = 4 \quad \cdots (3)$

Elimination method using eqn (3) and (4).

Sub $a = 4 - 5b \quad \cdots (5)$ into eqn (4)

$6(4 - 5b) - 25b = -17\frac{1}{4}$

$24 - 30b - 25b = -17\frac{1}{4}$

$-55b = -17\frac{1}{4} - 24$

$-55b = -41\frac{1}{4}$

$b = 3/4$ #

$a = \frac{1}{4}$ #

3) $x - y = 3 \quad \cdots (1)$

$x^2 + xy + 2y^2 = 22 \quad \cdots (2)$

Sub $x = 3 + y \quad \cdots (3)$ into eqn (2)

$(3+y)^2 + y(3+y) + 2y^2 = 22$

$9 + 6y + y^2 + 3y + y^2 + 2y^2 = 22$

$4y^2 + 9y - 13 = 0$

$(4y + 13)(y - 1) = 0$

$4y$	$+13$
y	-1
$4y^2$	$-13y$
	$+9y$

$\boxed{y = -\frac{13}{4}, \; x = -\frac{1}{4}}$ # or $\boxed{y = 1, \; x = 4}$ #

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4) $8x^2 - 9y^2 = 36$ ... (1)

$2p^2x - 9y = 6$ ... (2)

Sub $x = 3$ and $y = p$ into eq^n (1)

$8(3)^2 - 9(p)^2 = 36$

$72 - 9p^2 = 36$

$-9p^2 = 36 - 72$

$-9p^2 = -36$

$p^2 = \frac{-36}{-9}$

$p^2 = 4$

$p = \pm 2$

$\therefore p = 2$ * cos $y = 2$ and $x = 3$

$2(2)^2x - 9y = 6$

$2(-2)^2x - 9y = 6$

$8x^2 - 9y^2 = 36$ ... (3)

$8x - 9y = 6$ ... (4)

Sub $x = \frac{6+9y}{8}$ ... (5) into (3)

$8\left(\frac{6+9y}{8}\right)^2 - 9y^2 = 36$

$8\left(\frac{36+108y+81y^2}{64\ 8}\right) - 9y^2 \times 8 = 36 \times 8$

$1 \times 8 \quad 1 \times 8$

$36 + 108y + 81y^2 - 72y^2 = 288$

$9y^2 + 108y - 252 = 0$ (÷)

$y^2 + 12y - 28 = 0$

$(y+14)(y-2) = 0$

y	$+14$	$+14y$
y	-2	$-2y$
y^2	-28	$+12y$

$y = -14$ or $y = 2$

$x = -15$ $x = 3$

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5.) Let x be 1st no.

Let y be 2nd no.

$x - y = 1\frac{1}{2}$ ... (1)

$x^2 + y^2 = 11\frac{1}{4}$ ... (2)

Sub $x = 1\frac{1}{2} + y$ ... (3) into (2)

$(1\frac{1}{2} + y)^2 + y^2 = 11\frac{1}{4}$

$2\frac{1}{4} + 3y + y^2 + y^2 = 11\frac{1}{4}$

$2y^2 + 3y - 9 = 0$

$(2y - 3)(y + 3) = 0$

$2y$	-3
y	$+3$
$2y^2$	-9 | $+3y$

$y = \frac{3}{2}$, $x = 3$ or $y = -3$, $x = -1\frac{1}{2}$ #

6.) $y^2 - 4x = 0$ ... (1)

$2x + y = 4$ ... (2)

Sub $y = 4 - 2x$ ... (3) into (1)

$(4 - 2x)^2 - 4x = 0$

$16 - 16x + 4x^2 - 4x = 0$

$4x^2 - 20x + 16 = 0$

$\div 4$ $x^2 - 5x + 4 = 0$

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

x	-4
x	-1
x^2	-4 | $-5x$

$x = 4$, $y = -4$ or $x = 1$, $y = 2$ #

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7) $2x + 3y + 2 = 0 \quad \cdots (1)$

$2xy = -1 \quad \cdots (2)$

Sub $x = \frac{-1}{2y} \quad \cdots (3)$ into (1)

$2\left(\frac{-1}{2y}\right) + 3y + 2 = 0$

$\frac{-2}{2y} + \underbrace{3y \times 2y}_{1 \times 2y} + \underbrace{2x^{2y}}_{1 \times 2y} = 0$

$-2 + 6y^2 + 4y = 0$

$6y^2 + 4y - 2 = 0$

$3y^2 + 2y - 1 = 0$

$(3y - 1)(y + 1) = 0$

$3y$	-1	$-y$
y	$+1$	$+3y$
$3y^2$	-1	$+2y$

$\boxed{y = \frac{1}{3}, \; x = -1\frac{1}{2}}$ or $\boxed{y = -1, \; x = \frac{1}{2}}$

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8) $2(x - y) = x + 3y - 1$

$2x - 2y = x + 3y - 1$

$2x - x - 2y - 3y = -1$

$x - 5y = -1 \quad \cdots (1)$

$x + 3y - 1 = 2x^2 + 11y^2 \quad \cdots (2)$

Sub $x = -1 + 5y \quad \cdots (3)$ into (2)

$-1 + 5y + 3y - 1 = 2(-1 + 5y)^2 - 11y^2$

$-1 + 5y + 3y - 1 = 2(1 - 10y + 25y^2) - 11y^2$

$-1 + 5y + 3y - 1 = 2 - 20y + 50y^2 - 11y^2$

$0 = 39y^2 - 28y + 4$

$39y^2 - 28y + 4 = 0$

must solve quadratic eqn by quadratic formula →

$y = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a = 39, \; b = -28, \; c = 4.$

$(-1 + 5y)^2$

$= (-1 + 5y)(-1 + 5y)$

$= -1(+1) - 1(5y) + 5y(-1) + 5y(5y)$

$= 1 - 5y - 5y + 25y^2$

$= 1 - 10y + 25y^2$

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$$y = \frac{-(-28) \pm \sqrt{(-28)^2 - 4(39)(4)}}{2(39)}$$

$$y = \frac{28 \pm \sqrt{160}}{78}$$

$$y = \frac{28 + \sqrt{160}}{78} \quad \text{or} \quad y = \frac{28 - \sqrt{160}}{78}$$

$y = 0.521$
$x = 1.605$ #

$y = 0.197$
$x = -0.015$ #