

Ex 2.3 pg 57 + 58.

Q1

$$\begin{aligned} y &= x^2 \\ 2x + y &= 3 \end{aligned}$$

$$2x + x^2 = 3$$

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

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

$$x = -3 \quad x = 1$$

Find  $y$ :  $y = x^2$

at  $x = -3$

$$y = (-3)^2$$

$$y = 9$$

$$(-3, 9)$$

at  $x = 1$

$$y = (1)^2$$

$$y = 1$$

$$(1, 1)$$

Q2

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

$$x - y + 1 = 0$$

$$x = (y - 1)$$

(Isolate 1 variable)

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

(Sub into Quadratic)

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

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

(Bring it out)

$$y^2 - y - 2 = 0$$

$$(y - 2)(y + 1) = 0$$

$$y = 2 \quad y = -1$$

(Solve)

Find  $x$ :  $x = y - 1$

at  $y = 2$

$$x = 2 - 1$$

$$x = 1$$

$$(1, 2)$$

at  $y = -1$

$$x = -1 - 1$$

$$x = -2$$

$$(-2, -1)$$

} find other variable

Q5

$$\begin{aligned}x^2 + y^2 &= 25 \\x + y &= 7\end{aligned}$$

$$y = (7 - x)$$

(Isolate 1 variable)

$$x^2 + (7 - x)^2 = 25$$

(Sub into Quadratic)

$$x^2 + 49 - 14x + x^2 = 25$$

(Bash it out)

$$2x^2 - 14x + 24 = 0$$

(rearrange)

$$x^2 - 7x + 12 = 0$$

( $\div 2$ )

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

(Factorise)

$$x = 3 \quad x = 4$$

(solve)

Find  $y$ :  $y = 7 - x$

(Solve for other Variable)

at  $x = 3$

$$y = 7 - 3$$

$$y = 4$$

(3, 4)

at  $x = 4$

$$y = 7 - 4$$

$$y = 3$$

(4, 3)

$$\textcircled{Q8} \quad \begin{array}{l} x^2 + y^2 - 4x + 2 = 0 \\ x + y - 4 = 0 \end{array}$$

isolate 1 variable

$$y = 4 - x$$

sub into quadratic

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

Bash it out

$$x^2 + 16 - 8x + x^2 - 4x + 2 = 0$$

$$2x^2 - 12x + 18 = 0$$

rearrange

$$x^2 - 6x + 9 = 0$$

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

factorise

$$x = 3 \quad x = 3$$

solve

$$y = 4 - x$$

Solve for Other Variable

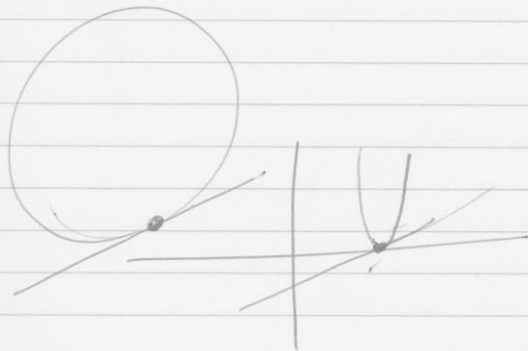
at  $x = 3$

$$y = 4 - 3$$

$$y = 1$$

Ans  $(3, 1)$

A Tangent as only one point of intersection.



Q10

$$\begin{aligned} xy &= 4 \\ \underline{2x^2 - y + 2 = 0} \end{aligned}$$

$$\begin{aligned} -y &= -2x - 2 \\ y &= 2x + 2 \end{aligned}$$

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

$$2x^2 + 2x = 4$$

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

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

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

$$x = -2 \quad x = 1$$

Solve for  $y$ :  $y = 2x + 2$

at  $x = -2$

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

$$y = -2$$

$$(-2, -2)$$

at  $x = 1$

$$y = 2(1) + 2$$

$$y = 4$$

$$(1, 4)$$

Q11

$$\begin{array}{r} y^2 + xy = 2 \\ 2x + y = 3 \\ \hline y = (3 - 2x) \end{array}$$

$$(3 - 2x)^2 + x(3 - 2x) = 2$$

$$9 - 12x + 4x^2 + 3x - 2x^2 = 2$$

$$2x^2 - 9x + 7 = 0$$

$$(2x - 7)(x - 1) = 0$$

$$2x = 7$$

$$x = 7/2$$

$$x = 1$$

Solve for  $y$ :  $y = 3 - 2x$

at  $x = 7/2$

$$y = 3 - 2(7/2)$$

$$y = 3 - 7$$

$$y = -4$$

$$(7/2, -4)$$

at  $x = 1$

$$y = 3 - 2(1)$$

$$y = 3 - 2$$

$$y = 1$$

$$(1, 1)$$

Q12

$$\begin{array}{l} x^2 + y^2 + 2x - 4y + 3 = 0 \\ x - y + 3 = 0 \end{array}$$

$$x = (y - 3)$$

$$(y - 3)^2 + y^2 + 2(y - 3) - 4y + 3 = 0$$

$$y^2 - 6y + 9 + y^2 + 2y - 6 - 4y + 3 = 0$$

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

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

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

$$y = 3 \quad y = 1$$

Solve for  $x$ :  $x = y - 3$

at  $y = 3$

$$x = 3 - 3$$

$$x = 0$$

$$(0, 3)$$

at  $y = 1$

$$x = 1 - 3$$

$$x = -2$$

$$(-2, 1)$$

Q14

$$2s^2 = t^2 + 1$$

$$2s = t - 3$$

$$\hline 2s + 3 = t$$

$$2s^2 = (2s + 3)^2 + 1$$

$$2s^2 = 4s^2 + 12s + 9 + 1$$

$$0 = 2s^2 + 12s + 10$$

$$0 = s^2 + 6s + 5$$

$$0 = (s + 5)(s + 1)$$

$$s = -5 \quad s = -1$$

Solve for  $t$ :  $t = 2s + 3$

at  $s = -5$

$$t = 2(-5) + 3$$

$$t = -10 + 3$$

$$t = -7$$

$$\left( \begin{array}{c} s \\ -5, \end{array} \begin{array}{c} t \\ 7 \end{array} \right)$$

at  $s = -1$

$$t = 2(-1) + 3$$

$$t = -2 + 3$$

$$t = 1$$

$$\left( \begin{array}{c} s \\ -1, \end{array} \begin{array}{c} t \\ 1 \end{array} \right)$$