

B LAWUYI FAWAZ OLOLADE

MAT 102

MR OKUNLOLA

MECHATRONICS

5th of may 2020

19/ENG05/052

1) Find the point of intersection of the following line on the

2) $x - y - 14 = 0$ and $x^2 + y^2 - 6x + 8y = 0$

$$-y = 14 - x$$

$$y = x - 14$$

subst $y = x - 14$ into $x^2 + y^2 - 6x + 8y = 0$

$$x^2 + (x - 14)^2 - 6(x - 14) + 8(x - 14) = 0$$

~~$$x^2 + x^2 - 28x + 196 - 6x + 84 = 0$$~~

$$x^2 + (x - 14)^2 - 6x + 8(x - 14) = 0$$

$$x^2 + x^2 - 28x + 196 - 6x + 8x - 112 = 0$$

$$2x^2 - 26x + 84 = 0$$

$$x^2 - 13x + 42 = 0$$

$$x^2 - 6x - 7x + 42 = 0$$

$$x(x - 6) - 7(x - 6) = 0$$

$$(x - 7)(x - 6) = 0$$

$$x = 7 \text{ or } x = 6$$

when $x = 7$ $y = 7 - 14 = -7$

$x = 6$ $y = 6 - 14 = -8$

$x = 7, y = -7$ $(7, -7)$

$x = 6, y = -8$ $(6, -8)$

$$\text{ii) } 2x + y + 10 = 0 \text{ and } x^2 + y^2 + 4x - 6y = 0$$

$$2x = -y - 10$$

$$x = \frac{-y}{2} + 5$$

$$\text{Subst } x \text{ in } x^2 + y^2 + 4x - 6y = 0$$

$$\left(\frac{-y}{2} + 5\right)^2 + y^2 + 4\left(\frac{-y}{2} + 5\right) - 6y = 0$$

$$\frac{y^2}{4} - \frac{5y}{2} + \frac{25}{1} + y^2 - \frac{5y}{2} + 20 - 2y + 20 - 6y = 0$$

$$y^2 - 10y - 10y + 100 + y^2 - 8y + 80 - 24y = 0$$
$$2y^2 - 52y + 180 = 0$$

~~unsolvable~~

-20x - 12

$$x - 5y - 2 = 0 \text{ and } x^2 + 25y^2 - 6xy - 16 = 0$$

$$x = 5y + 2$$

Subst x into $x^2 + 25y^2 - 6xy - 16 = 0$

$$(5y + 2)^2 + 25y^2 - 6(5y + 2)y - 16 = 0$$

$$25y^2 + 10y + 10y + 4 + 25y^2 - 30y^2 - 12y - 16 = 0$$

$$20y^2 - 8y - 12 = 0$$

$$20y^2 - 20y + 12y - 12 = 0$$

$$20y(y - 1) + 12(y - 1) = 0$$

$$(20y + 12)(y - 1) = 0$$

$$20y = -12 = \frac{-12}{20} = \frac{-3}{5} \text{ or}$$

$$y = 1$$

When $y = -\frac{3}{5}$ $x = 5 \times \frac{-3}{5} + 2 = -1$

When $y = 1$ $x = 5 + 2 = 7$

Therefore $(-1, -\frac{3}{5})$
 $(7, 1)$