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Level: 100

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$$1) x^2 + y^2 + 2x + 6y + 6 = 0$$

$$x^2 + y^2 + 2x + 6y = -6$$

$$x^2 + 2x + y^2 + 6y = -6$$

$$\left(\frac{2}{2}\right)^2 = 1 \quad \left(\frac{6}{2}\right)^2 = 9$$

$$(x^2 + 2x + 1) + (y^2 + 6y + 9) = -6$$

$$(x+1)^2 + (y+3)^2 = -6 + 9 + 1$$

$$(x+1)^2 + (y+3)^2 = 4$$

$$(x+1)^2 + (y+3)^2 = \sqrt{4}$$

$$(x+1)^2 + (y+3)^2 = 2$$

∴ Centre is at (-1, -3) and radius = 2

$$2) x^2 + y^2 - 4x + 10y - 8 = 0$$

$$x^2 + y^2 - 4x + 10y = 8$$

$$x^2 - 4x + y^2 + 10y = 8$$

$$\left(\frac{-4}{2}\right)^2 = 4 \quad \left(\frac{10}{2}\right)^2 = 25$$

$$(x^2 - 4x + 4) + (y^2 + 10y + 25) = 8$$

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

$$8 + 4 + 25$$

centre is at (2, -5) radius = $\sqrt{37}$