

IGCSE - Additional Mathematics

Topic: Simultaneous linear and non-linear equations

Name:

Date:

Solve the following simultaneous linear equations

[a] $2x = 5 - y$

$$x + 2y = 7$$

Answer: $x = 1$ & $y = 3$

[b] $y + 2x = 7$

$$y^2 = xy - 1$$

Answer : $x = 3\frac{1}{3}$ & $y = \frac{1}{3}$

[c] $4x + 3y = 8$

$$2y - 3x = 11$$

Answer : $x = -1$ & $y = 4$

II. Solve the following simultaneous non-linear equations

[a] $y^2 - 4x = 0$
 $2x + y = 4$

Answer : (1 , 2) & (4 , -4)

[b] $y = 2x + 1$
 $6xy = 2x + y + 3$

Answer : $\left(-\frac{2}{3}, -\frac{1}{3}\right)$ and $\left(\frac{1}{2}, 2\right)$

[c] $3x = 1 + 2y$
 $9x^2 + y = 7$

Answer : $\left(\frac{5}{6}, \frac{3}{4}\right)$ & $(-1, -2)$

[d] $2y + 3 = 3x$
 $yx = 3$

Answer : $(-1, -3)$ & $\left(2, 1\frac{1}{2}\right)$

[e] $(x + 1)^2 + (y + 1)^2 = 25$

$$x + y = 5$$

Answer : (2,3) & (3,2)

[f] $3y - x = 3$

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

[g] $\frac{x^2}{6} - \frac{y}{4} = 1$

$$x + y = 5$$

Answer : $\left(-\frac{9}{2}, \frac{19}{2}\right)$ & (3,2)

Use Math Graphing Software [Graphmatica](#) or [Geogebra](#) to sketch each questions. Observe the nature of the curves and find the point of intersection of the curves from the graph and compare with your answers.
