

Simultaneous equations (Two unknowns)

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Worked example

Solve:

$$2x + 3y = 11$$

$$3x + y = 13$$

$$3x + 2y = 9$$

$$5x + 7y = 4$$

Your turn

Solve:

$$2x + 3y = 9$$

$$5x + 7y = 23$$

$$x = 6, y = -1$$

Worked example

Solve:

$$\begin{aligned}y &= 4x - 9 \\ -5y - 3x &= -1\end{aligned}$$

Your turn

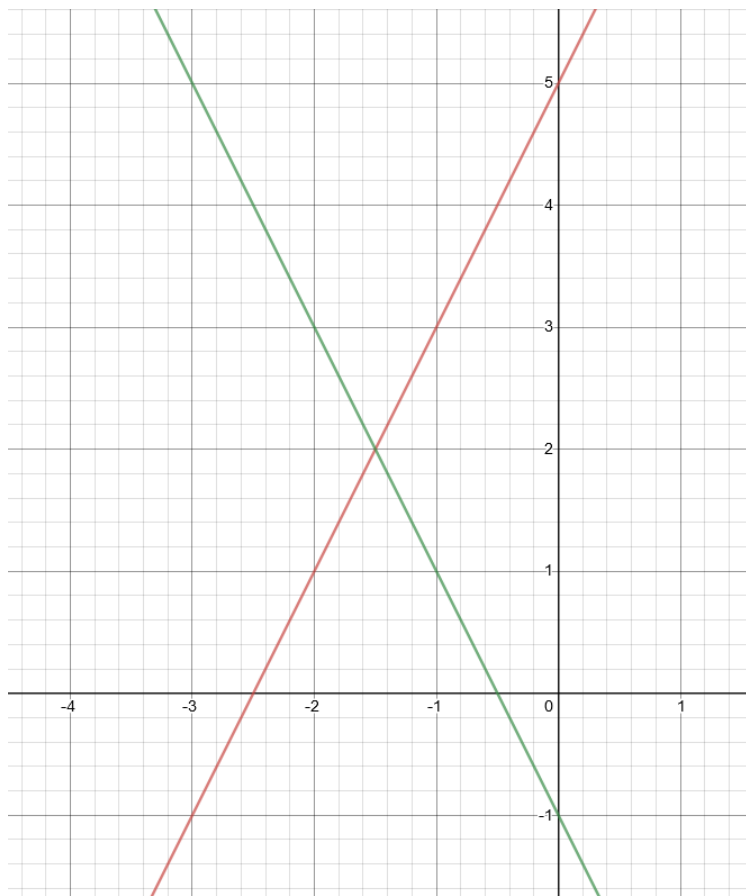
Solve:

$$\begin{aligned}y &= 2x - 3 \\ -9y - 4x &= -17 \\ x = 2, y &= 1\end{aligned}$$

Worked example

Solve:

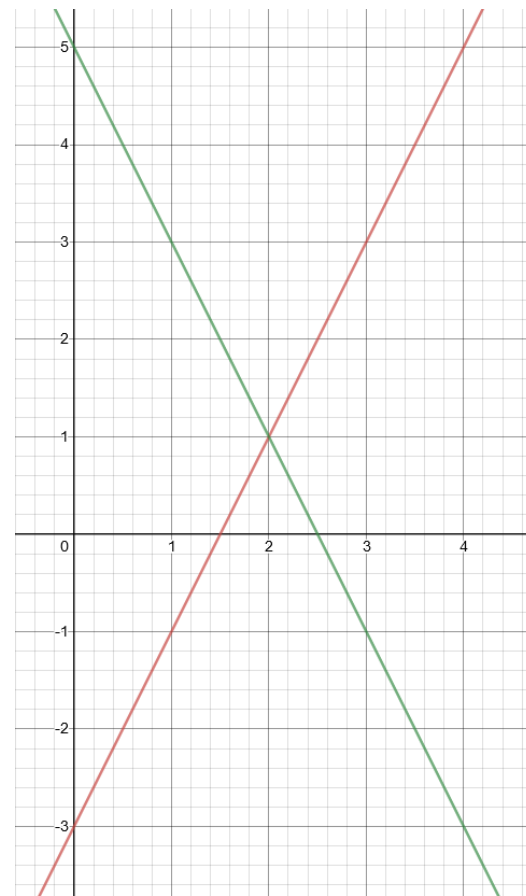
$$y = 2x + 5$$
$$y = -2x - 1$$



Your turn

Solve:

$$y = 2x - 3$$
$$y = -2x + 5$$



$$x = 2, y = 1$$

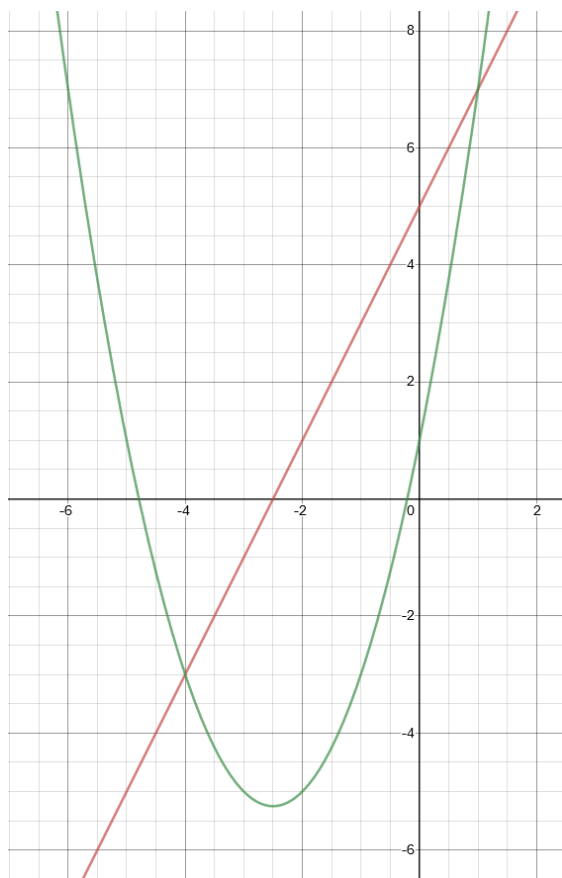
Graph used with permission from DESMOS: <https://www.desmos.com/>

Worked example

Solve:

$$y = 2x + 5$$

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

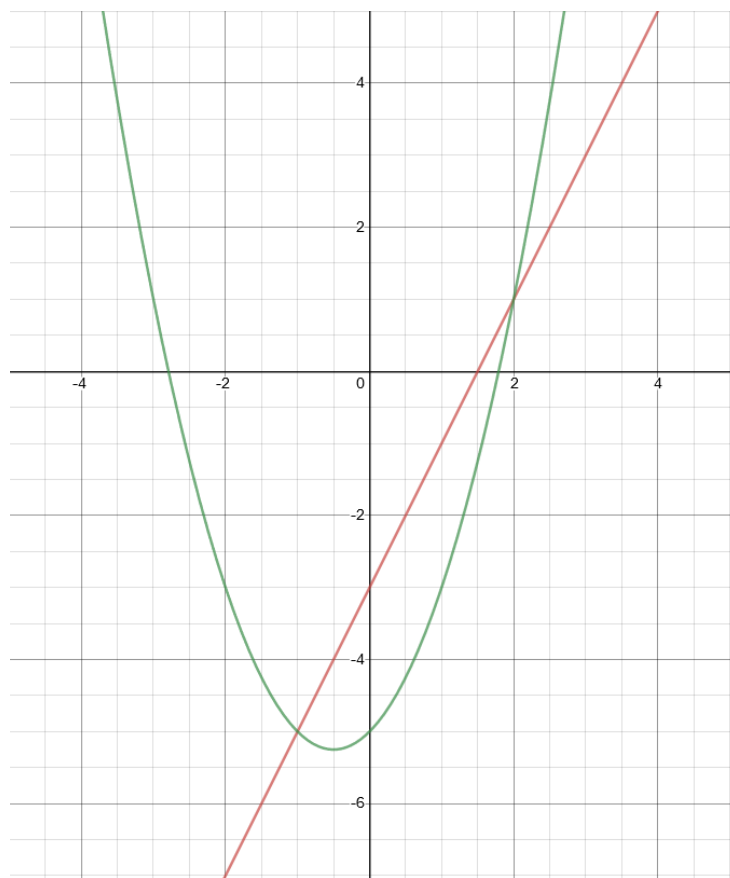


Your turn

Solve:

$$y = 2x - 3$$

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



$$x = 2, y = 1$$

$$x = -1, y = -5$$

Graph used with permission from DESMOS: <https://www.desmos.com/>

Worked example

Solve:

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

$$y = 2x + 4$$

Your turn

Solve:

$$y = x^2 + 7x - 2$$

$$y = 2x + 4$$

$$x = 1, y = 6$$

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

Worked example

Solve:

$$\begin{aligned}x + y &= 3 \\ x^2 + y^2 &= 9\end{aligned}$$

Your turn

Solve:

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

Worked example

Solve:

$$\begin{aligned}y &= 2x + 1 \\ x^2 + y^2 &= 29\end{aligned}$$

Your turn

Solve:

$$\begin{aligned}y &= 3x - 1 \\ x^2 + y^2 &= 73\end{aligned}$$

$$x = 3, y = 8$$

$$x = -\frac{12}{5}, y = -\frac{41}{5}$$

Worked example

Solve:

$$3y^2 - 2x^2 = 10$$

$$y + x = 13$$

Your turn

Solve:

$$4y^2 - 3x^2 = -12$$

$$y + x = 7$$

$$x = 4, y = 3$$

$$x = 52, y = -45$$

Worked example

Solve:

$$xy = 12$$

$$y = x + 4$$

$$xy = 12$$

$$x = y - 2$$

Your turn

Solve:

$$xy = 12$$

$$y = x + 11$$

$$x = 1, y = 12$$

$$x = -12, y = -1$$

Worked example

Solve the simultaneous equations:

$$10x^2 - 5xy + 7y^2 - \frac{97}{4} = 0$$

$$y - x = 2$$

Your turn

Solve the simultaneous equations:

$$10x^2 + 5xy - 7y^2 + 23 = 0$$

$$x - y = 2$$

$$x = \frac{1}{4}, y = -\frac{7}{4}$$

$$x = -\frac{5}{2}, y = -\frac{9}{2}$$

Worked example

Solve the simultaneous equations:

$$4x^2 + xy - 3y^2 + \frac{5}{9} = 0$$

$$y = 3x - 1$$

Your turn

Solve the simultaneous equations:

$$3y^2 - xy - 4x^2 - 13 = 0$$

$$y = 2x + 1$$

$$x = \frac{2}{3}, y = \frac{7}{3}$$

$$x = -\frac{5}{2}, y = -4$$