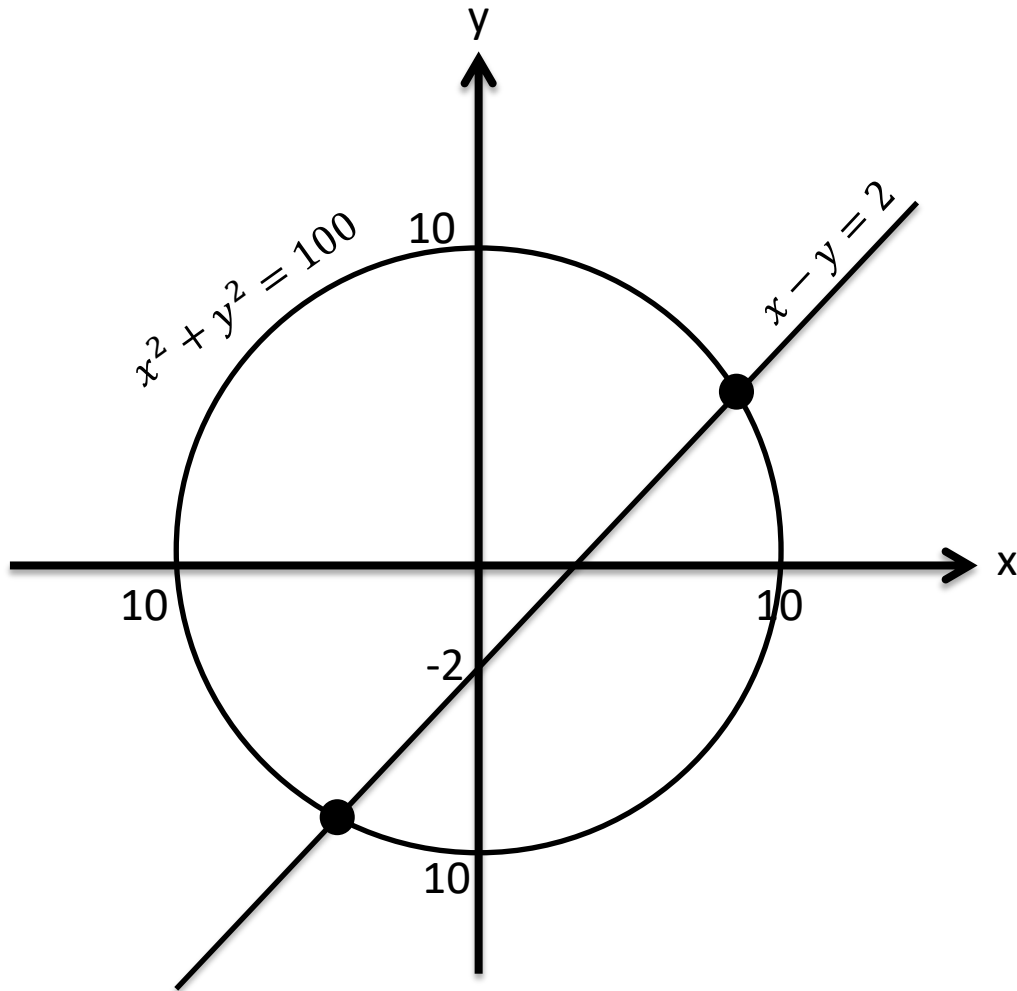


Quadratic Simultaneous Equations





Given a circle and a line, we may wish to find the point(s) at which the circle and line intersect.

How could we do this algebraically?



STEP 1: Rearrange linear equation to make x or y the subject.

STEP 2: Substitute into quadratic and solve.

STEP 3: Use an equation (e.g from Step 1) to find the values of the other variable.

$$x^2 + y^2 = 17$$
$$x + 2y = 2$$

Step 1: Rearrange linear equation to make x or y the subject.

Step 2: Substitute into quadratic equation and solve.

Step 3: Use an equation (e.g from Step 1) to find the values of the other variable.

A

$$y = x^2 - 3x + 4$$
$$y = x + 1$$

B Solve the following, giving your solutions correct to 3 significant figures.

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

$$2x + y = 1$$

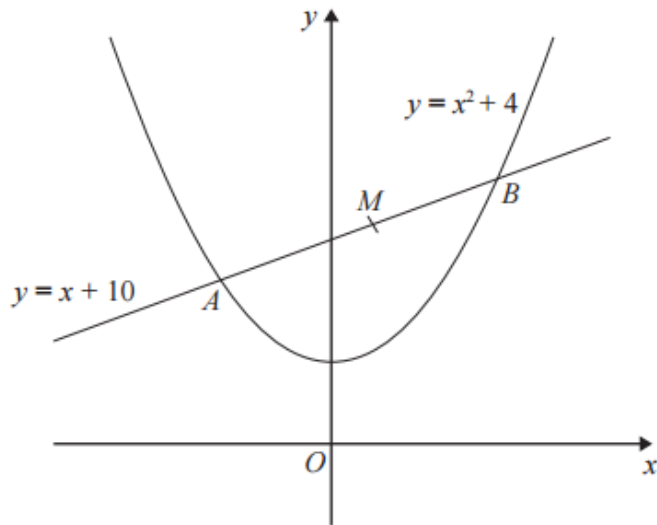
If $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

C Solve $y = x + 2$, $y^2 = 4x + 5$

D Solve $x = 2y$,
 $x^2 - y^2 + xy = 20$

- X The lines with equations $y = x^2 + 4$ and $y = x + 10$ intersect at the points A and B . M is the midpoint of AB . Find the coordinates of M .



Y

Here are the equations of three lines.

$$y = \frac{1}{2}x + 11 \quad y = \frac{1}{3}x + 14$$

$$y = 2x - 16$$

Do all three lines meet at a common point?

Show how you decide.

Solve the following:

$$x^2 - 4y + 7 = 0$$

$$y^2 - 6z + 14 = 0$$

$$z^2 - 2x - 7 = 0$$