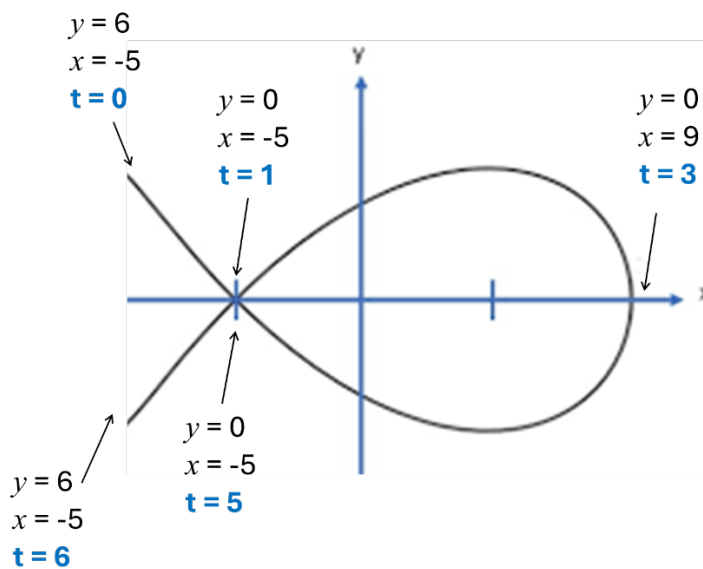


Year 2 Pure Chapter 8 - Parametric Equations

Parametric Graphs

The x co-ordinate and the y co-ordinate are calculated independently of each other.



x and y co-ordinates are calculated using the t variable

Parametric to Cartesian without Trig functions

x equation:

make t the subject.

y equation:

substitute the t equation into the y equation.

Example A

$$x = 2t$$

$$y = t^2$$

Make t the subject:

$$t = \frac{x}{2}$$

Substitute into the

y equation:

$$y = \frac{x^2}{4}$$

Parametric to Cartesian with Trig functions

Identify a trig identity that connects the x and y equations.

Example A

$$x - 2 = \sin t$$

$$y + 3 = \cos t$$

can be connected by

$$\sin^2 t + \cos^2 t = 1$$

to give

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

Example B

$$x = \sin t$$

$$y = \sin 2t$$

can be connected by

$$y = 2 \sin t \cos t$$

and

$$\sin^2 t + \cos^2 t = 1$$

rearrange to

$$\sin t = \sqrt{1 - \cos^2 t}$$

then substitute to give

$$y = 2x\sqrt{1 - \cos^2 t}$$