

Conic Sections 1 2A

1 a $y = 10t$

So $t = \frac{y}{10}$ (1)

$x = 5t^2$ (2)

Substitute (1) into (2):

$$x = 5\left(\frac{y}{10}\right)^2$$

So $x = \frac{5y^2}{100}$ simplifies to $x = \frac{y^2}{20}$

Hence, the Cartesian equation is
 $y^2 = 20x$

b $y = t$ (1)

$x = \frac{1}{2}t^2$ (2)

Substitute (1) into (2):

$$x = \frac{1}{2}y^2$$

Hence, the Cartesian equation is
 $y^2 = 2x$

c $y = 100t$

So $t = \frac{y}{100}$ (1)

$x = 50t^2$ (2)

Substitute (1) into (2):

$$x = 50\left(\frac{y}{100}\right)^2$$

So $x = \frac{50y^2}{10\,000}$ simplifies to $x = \frac{y^2}{200}$

Hence, the Cartesian equation is
 $y^2 = 200x$

1 d $y = \frac{2}{5}t$

So $t = \frac{5y}{2}$ (1)

$x = \frac{1}{5}t^2$ (2)

Substitute (1) into (2):

$$x = \frac{1}{5}\left(\frac{5y}{2}\right)^2$$

So $x = \frac{25y^2}{20}$ simplifies to $x = \frac{5y^2}{4}$

Hence, the Cartesian equation is
 $y^2 = \frac{4}{5}x$

e $y = 5t$

So $t = \frac{y}{5}$ (1)

$x = \frac{5}{2}t^2$ (2)

Substitute (1) into (2):

$$x = \frac{5}{2}\left(\frac{y}{5}\right)^2$$

So $x = \frac{5y^2}{50}$ simplifies to $x = \frac{y^2}{10}$

Hence, the Cartesian equation is
 $y^2 = 10x$

$$1 \text{ f } y = 2\sqrt{3}t$$

$$\text{So } t = \frac{y}{2\sqrt{3}} \quad (1)$$

$$x = \sqrt{3}t^2 \quad (2)$$

Substitute (1) into (2):

$$x = \sqrt{3} \left(\frac{y}{2\sqrt{3}} \right)^2$$

$$\text{So } x = \frac{\sqrt{3}y^2}{12} \text{ gives } y^2 = \frac{12x}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

Hence, the Cartesian equation is
 $y^2 = 4\sqrt{3}x$

$$g \quad x = 4t$$

$$\text{So } t = \frac{x}{4} \quad (1)$$

$$y = 2t^2 \quad (2)$$

Substitute (1) into (2):

$$y = 2 \left(\frac{x}{4} \right)^2$$

$$\text{So } y = \frac{2x^2}{16} \text{ simplifies to } y = \frac{x^2}{8}$$

Hence, the Cartesian equation is

$$x^2 = 8y$$

$$h \quad x = 6t$$

$$\text{So } t = \frac{x}{6} \quad (1)$$

$$y = 3t^2 \quad (2)$$

Substitute (1) into (2):

$$y = 3 \left(\frac{x}{6} \right)^2$$

$$\text{So } y = \frac{3x^2}{36} \text{ simplifies to } y = \frac{x^2}{12}$$

Hence, the Cartesian equation is $x^2 = 12y$

$$2 \text{ a } xy = t \times \left(\frac{1}{t} \right)$$

$$xy = \frac{t}{t}$$

Hence, the Cartesian equation is

$$xy = 1$$

$$b \quad xy = 7t \times \left(\frac{7}{t} \right)$$

$$xy = \frac{49t}{t}$$

Hence, the Cartesian equation is $xy = 49$

$$c \quad xy = 3\sqrt{5}t \times \left(\frac{3\sqrt{5}}{t} \right)$$

$$xy = \frac{9(5)t}{t}$$

Hence, the Cartesian equation is $xy = 45$

$$d \quad xy = \frac{t}{5} \times \left(\frac{1}{5t} \right)$$

$$xy = \frac{t}{25t}$$

Hence, the Cartesian equation is

$$xy = \frac{1}{25}$$

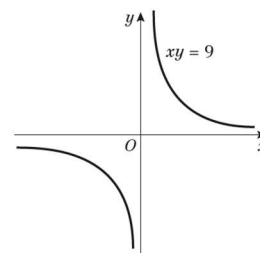
$$3 \text{ a } xy = 3t \times \left(\frac{3}{t} \right)$$

$$xy = \frac{9t}{t}$$

Hence, the Cartesian equation is

$$xy = 9$$

b



$$4 \text{ a } xy = \sqrt{2}t \times \left(\frac{\sqrt{2}}{t}\right)$$

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

Hence, the Cartesian equation is $xy = 2$

b

