## THE GC SCHOOL OF CAREERS

## DEPARTMENT OF MATHEMATICS

## EXTRA PRACTICE

## CORE MATHEMATICS 4

## COORDINATE GEOMETRY

## EXERCISES

1. Find the cartesian equation of the curve given by $x=t^{\frac{3}{2}}, y=4 t^{3}$.
2. A curve has parametric equations $x=3 \cos t, y=\cos 2 t, 0 \leq t \leq \pi$.
(a) Find the cartesian equation of the curve.

The curve cuts the $x$-axis at $(a, 0)$ and $(b, 0)$
(b) Find the exact values of $a$ and $b$.
3. The curve with parametric equations $x=4 t, y=\frac{4}{t}, t \neq 0$ meets the curve
$2 y^{2}+x=0$ at $P$. Find the coordinates of the point $P$.
4. The diagram shows a sketch of the curve with parametric equations

$$
x=t^{2}, y=t(2-t), t \geq 0
$$

The curve meets the $x$-axis at $x=0$ and $x=4$.
The shaded region $R$ is bounded by the curve and the $x$-axis.
Find the exact area of $R$.

5. A circle has parametric equations $x=\cos \theta-5, y=\sin \theta+3,0 \leq \theta \leq 2 \pi$.

Find the cartesian equation and hence draw a sketch of the circle.

## ANSWERS

1. $y=4 x^{2}$
2. (a) $y=\frac{2 x^{2}}{9}-1$
(b) $a=\frac{3 \sqrt{2}}{2}, b=-\frac{3 \sqrt{2}}{2}$
3. $(-8,-2)$
4. $\frac{8}{3}$
5. $(x+5)^{2}+(y-3)^{2}=1$, Centre $(-5,3)$ and Radius $=1$
