**QUESTION 1** 

**QUESTION 2** 

**QUESTION 3** 

**QUESTION 4** 

**QUESTION 5** 

Calculate the finite area enclosed by the graph of y = x(x - 4) and the x- axis

Prove that  $(\cos x - \sin x)^2 + (\sin x + \cos x)^2 = 2$ 

Express  $2\log x + 0.5\log y - 3\log z$  as a single logarithm

The graph of  $y = x^2 - \frac{1}{3}x^3 + ax$  passes through (3,24). Find the x- coordinates of the stationary points

Find the coefficient of the x<sup>5</sup> term in the expansion of  $\left(3 + \frac{1}{3}x\right)^9$ 

**QUESTION 1** 

**QUESTION 2** 

**QUESTION 3** 

**QUESTION 4** 

**QUESTION 5** 

Calculate the finite are enclosed by the graph of  $y = 16 + 6x - x^2$  and the x-axis

Solve  $cos^2\theta - sin^2\theta = -0.5$  for  $0^\circ < \theta < 360^\circ$ 

Simplify 2 ln  $e^{-x}$  + ln  $e^{x}$  – ½ln  $e^{4x}$ 

Given that  $y = x^3 - 5x^2 + kx$  has a stationary point where x = 2, find the value of the y coordinate at the stationary point

Find the coefficient of the x<sup>4</sup> term in the expansion of  $(x - 1)(1 + 2x)^7$ 

Sketch the graph of y = x(x - 1)(x - 3). Calculate the total area bounded by the graph of y and the x axis between x = 0 and x = 3

Solve  $3tan\theta sin\theta = cos\theta$  for  $0^{\circ} < \theta < 360^{\circ}$ 

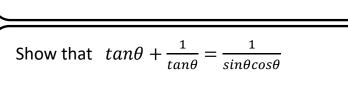
Solve  $\ln x = \ln (x + 4) - \ln(x + 1)$ 

Given that  $y = 2\sqrt{x} - ax + 10$  passes through the point (1,6) find the x-coordinate of the stationary point

Find the coefficient of the x<sup>5</sup> term in the expansion of  $\left(\frac{1}{3} - 3x\right)^{10}$ 

Find  $\int_{4}^{9} 3x + 4\sqrt{x} + 2 \, dx$ 

QUESTION 1 **QUESTION 2 QUESTION 3 QUESTION 4 QUESTION 5** 



Solve  $3^{3x-1} = \frac{1}{2}$  giving your answer correct to 3 significant figures

Find the equation of the normal to the curve  $y = 8x^4 - 3$  at the point where  $x = -\frac{1}{2}$ 

Find the coefficient of the x<sup>4</sup> term in the expansion of  $(x^2 - 1)(2 - 3x)^5$ 

Find  $\int_1^9 1 + 2x + \sqrt{x} \, dx$ 

QUESTION 1

**QUESTION 2** 

QUESTION 3

**QUESTION 4** 

**QUESTION 5** 

Solve  $\frac{4\cos\theta - 1}{\tan\theta} = 2\sin\theta$   $0^{\circ} < \theta < 360^{\circ}$ 

Express  $\log_a 1 + \frac{1}{2} \log_a 36 + 3 \log_a 4 - 2 \log_a 2$  as a single logarithm

Find the equation of the normal to the curve y =  $10\sqrt{x} - 10$  at the point where x = 4

Find the coefficient of the x<sup>6</sup> term in the expansion of  $\left(\frac{1}{2} + 2x\right)^{12}$ 

Evaluate  $\int_{-3}^{0} (2x+3)^2 dx$ 

QUESTION 1

**QUESTION 2** 

**QUESTION 3** 

**QUESTION 4** 

**QUESTION 5** 

Solve  $5sin\theta = 1 + 2cos^2\theta$   $0^{\circ} < \theta < 360^{\circ}$ 

Solve  $4e^{2x} = 9$  expressing your answer in the form ln p where p is a rational number

Find the equation of the tangent to the curve  $y = x^2 \sqrt{x}$  at the point where x = 4

Find the coefficient of the x<sup>5</sup> term in the expansion of  $(x^2 - 2)(2 - 2x)^6$ 

**QUESTION 1** 

**QUESTION 2** 

**QUESTION 3** 

**QUESTION 4** 

**QUESTION 5** 

Calculate the area enclosed by the parabolas  $y = 10x - 2x^2$  and  $y = 5x - x^2$ 

Solve  $sin(3x - 60^{\circ}) = 0.5$  for  $0^{\circ} \le x \le 360^{\circ}$ 

R = 600  $e^{-0.5t}$  Find the value of t when R = 180 giving your answer to 3 significant figures.

Find the x coordinates of the stationary points of the curve  $y = x^5 - 60x^3$ 

Find the coefficient of the x<sup>5</sup> term in the expansion of  $\left(3 - \frac{1}{3}x\right)^{11}$