

## Progress Checking Test

Write your name here:

- 1) Find  $\frac{dy}{dx}$  when  $y = e^{\sin x}$
- 2) Find  $\frac{dy}{dx}$  when  $y = e^x \sin x$
- 3) Find  $\frac{dy}{dx}$  when  $y = \sin(e^x)$

Please turn over for question 4

A satellite is orbiting the moon. Its position can be described in polar co-ordinates by the equation

$$r = \frac{300}{2 + \cos \theta},$$

where  $r$  is the distance from the moon (in  $km$ ) and  $\theta$  is the angle (in radians).

4a) Find  $\frac{dr}{d\theta}$ .

4b) Solve  $\frac{dr}{d\theta} = 0$ .

4c) Find the minimum distance from the moon which the satellite reaches during its orbit.

---

**Congratulations! You have finished the test!** There is a little bit of space below. Please write below anything from the course which you would like to more time on.