

## Problem Solving questions: Differentiation

Wednesday, 13 November 2013

4:39 PM

- 1. Ben is pushing a bicycle up a parabolic shaped hill. The hill starts at (0,0) and has a turning point at (100,50). When the gradient of the hill is less than 0.4 he can start riding up the hill. At what point can he start riding up the hill?**
- 2. The normal to the curve  $y = x^2 + 7x + 12$  at  $x = -1$ , cuts the curve again at another point Q. Find the coordinates of point Q.**
- 3. A spherical lollipop has a radius of 3cm. The volume of the lollipop is dissolving at a rate of  $0.1\text{cm}^3$  per minute. At what rate is the radius changing with respect to time when the radius is 1cm?**  
(Volume of a sphere =  $\frac{4}{3}\pi r^3$ )
- 4. if  $f(x) = \frac{10}{x}$  find  $f^{-1}(x)$**