

## Answer Sheet 3

1.    a)  $\frac{dy}{dx} = 3$                       b)  $\frac{dy}{dx} = 2x + 2$                       c)  $\frac{dy}{dx} = \frac{4}{(1+2x)^2}$

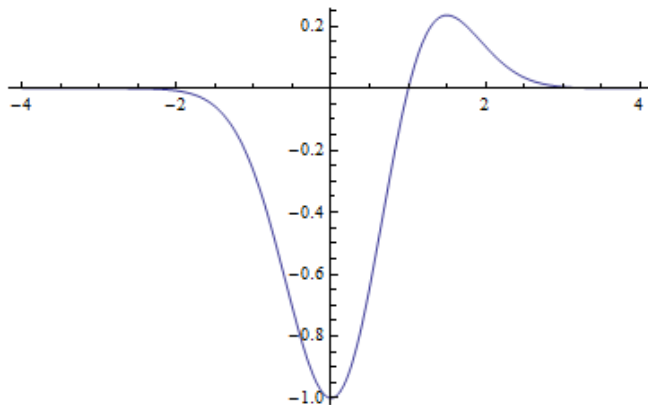
      d)  $\frac{dy}{dx} = \frac{2x}{\sqrt{1+2x^2}}$                       e)  $\frac{dy}{dx} = 3x^2 + 2x - 1$                       f)  $\frac{dy}{dx} = \frac{x}{\sqrt{x^2 - 1}}$

2.     $y = x - 2, \quad y = 3 - x$

3.    a) tends to zero. From above for positive infinity, from below for negative infinity.

b)     $x = 0, \quad x = 3/2$

c)    As shown by the sign of the 2nd derivative, the first is a minima and the second a maxima.

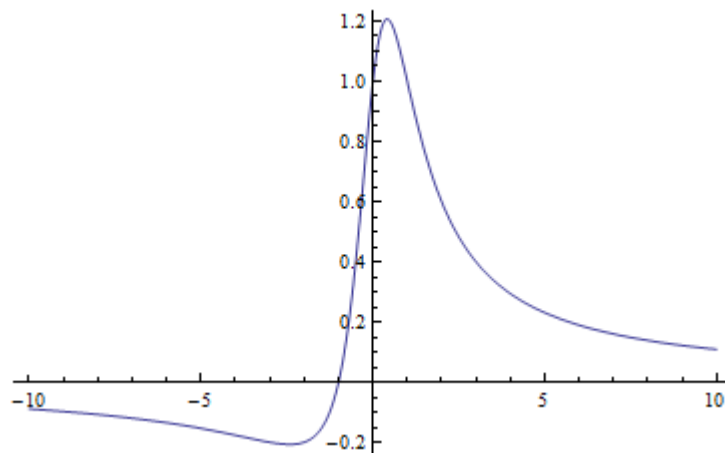


d)

4. a) tends to zero. From above for positive infinity, from below for negative infinity.

b)  $x = -1 - \sqrt{2}, \quad x = -1 + \sqrt{2}$

c) As shown by the sign of the 2nd derivative, the first is a minima and the second a maxima.



d)

5.  $-2x(1+x^2)^{-2}$ ,  $2(3x^2-1)(1+x^2)^{-3}$ ,  $24x(1-x^2)(1+x^2)^{-4}$

6.  $y = -x$ ,  $y = 26x + 54$