MA1M01 Calculus Assignment 2 Michaelmas term week 4

www.maths.tcd.ie/pub/MA1M01/Calculus/

- 1. [20 points] Solve each of the following for the values of x such that f(x) = 0:
 - (a) f(x) = x(x-3)(b) $f(x) = x^2 - 1$ (c) $f(x) = x^2 - 6x + 8$ (d) $f(x) = x^2 + 10x + 21$
- 2. [20 points] A ball is dropped from a height of 125 metres. The height of the ball above ground level follows the equation

$$h(t) = 125 - 5t^2$$

where t represents time in seconds and $t \ge 0$.

- (a) Find the height of the ball above ground level after 2 seconds.
- (b) How many seconds does it take the ball to reach the ground?
- 3. [40 points] Compute the derivative $\frac{dy}{dx}$ of each of the following
 - (a) $y = x^2 + x$ (b) y = 6x(x-1)(c) $y = (x+2)^3$ (d) $y = \frac{x^4 - 3x^2}{7}$
- 4. [20 points] Compute the slope of the tangent line to y at the given point for both of the following:

(a)
$$y = x^3 - 8x^2$$
 at $x = 2$
(b) $y = -\frac{3x^4}{4} + \frac{4x}{9}$ at $x = -1$

Homework is due one week from when it is given in the tutorial you are assigned to. This set should be handed up in week 5.