Lab Assignment 7

1. Find the first derivative of the following functions using

(i) Forward difference (ii) Backward difference (iii) Central difference

(a) $f(x) = x^3 + 4x - 15; x = [-2,2]; h = \{0.5,0.25,0.125\}$

(b) $f(x) = x^2 \cos x; x = [0,4]; h = \{0.5,0.25,0.125\}$

(c) $f(x) = \tan(x/3); x = [0,4]; h = \{0.5,0.25,0.125\}$

(d) $f(x) = \sin(0.5\sqrt{x})/x; x = [0.5,2]; h = \{0.5,0.25,0.125\}$

(e) $f(x) = e^x + x; x = [-2,2]; h = \{0.5,0.25,0.125\}$

Also compare with the analytic results.

2. Find the second derivative of the functions given in (a) using central difference and compare with the analytic results.