Newton's method - Answers

For questions 1 & 2 use Newton's Method to determine x_2 for the given function and given value of x_0.

1. $f(x) = x^3 - 7x^2 + 8x - 3, \; x_0 = 5$	2. $f(x) = x\cos(x) - x^2, \; x_0 = 1$
$x_1 = 6 \quad x_2 = 5.71875$	$x_1 = 0.8002329432 \quad x_2 = 0.7440943985$

For problems 3 & 4 use Newton's Method to find the root of the given equation, accurate to six decimal places, that lies in the given interval.

3. $x^4 - 5x^3 + 9x + 3 = 0$ in $[4, 6]$	4. $2x^2 + 5 = e^x$ in $[3, 4]$
$x_1 = 4.641791045 \quad x_2 = 4.537543959$ $x_3 = 4.528973727 \quad x_4 = 4.52891796$ $x_5 = 4.52891796 \quad$ so, $x \approx 4.52891796$	$x_1 = 3.310862334 \quad x_2 = 3.276614422$ $x_3 = 3.275601951 \quad x_4 = 3.275601089$ so, $x \approx 3.275601089$

For questions 5 & 6, use Newton's Method to find all the roots of the given equation accurate to six decimal places.

5. $x^3 - x^2 - 15x + 1 = 0$	6. $2 - x^2 = \sin(x)$
$x \approx -3.44214617; \; x \approx 0.06639231426$ $x \approx 4.375753856$	$x \approx -1.728466319; \; x \approx 1.061549775$