1. Use the Intermediate Value Theorem to find an interval of length one that contains a root of the equation. (a) $x^3 = 9$ (b) $3x^3 + x^2 = x + 5$ (c) $\cos^2 x + 6 = x$

IVT $\cos^2 x + 6 = x$ $\cos^2 x + 6 - x$

if $x = 0$

$1 + 6 - 0 = 7 > 0$

if $x = 1$

$0.9996 + 6 - 1 > 0$

if $x = 5$

$0.4424 + 6 - 5 > 0$

if $x = 6$

$0.9891 + 6 - 6 > 0$

if $x = 7$

$0.9851 + 6 - 7 < 0$

$[6, 7]$ contain a root of the equation

6. Use the Bisection Method to calculate the solution of $\cos x = \sin x$ in the interval $[0, 1]$ within six correct decimal places.