Comp. – Eng.

CALCULUS 1

MID-TERM EXAM 2/11/2016

* Solve all the given questions!

1) Show that for every value of x

$|\cos x - 1| \leq |x|$.

$\left|\frac{\cos x - 1}{x}\right| \leq 1 \quad -1 \leq \frac{\cos x - 1}{x} \leq 1$

$-x \leq \cos x - 1 \leq x$

$-x+1 \leq \cos x \leq x+1$

2) Determine the asymptote(s) of

$f(x) = \frac{\sqrt{x^2+4}}{x}$ (if any).

3) A particle at the first quadrant moves on $y = x^{3/2}$ by the rate of change of its distance from origin 11 m/sec. Find $\frac{dx}{dt}$ at $x = 3m$.

4) Prove that

$$\int_0^x \left[\int_0^u f(t)\,dt \right] du = \int_0^x f(u)(x-u)\,du.$$

$f(x)$.

x and u are not functions of eachother.

GOOD LUCK... 60min.

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