King **F**ahd **U**niversity for **P**etroleum and **M**inerals
Department of Mathematics & Statistics
Term 131 Math 101 Quiz#10
Family Name: S.r#

Q1. Evaluate the limits

i. $\lim_{x\to\infty}\dfrac{3x^3-2x^2+x}{x^3+1}$ *ii*. $\lim_{x\to 0}\dfrac{2^x-1}{3^x-4^x}$

iii. $\lim_{x\to\infty}\left(\dfrac{x}{2x+1}\right)^x$ *iv*. $\lim_{x\to 0}\left(e^x+x\right)^{\frac{1}{x}}$

v. $\lim_{x\to\infty}\dfrac{5^x-3^x}{5^x+3^x}$ *vi*. $\lim_{x\to 0^+}\left(2^x-1\right)^x$

Q2. Use Newton's Method to estimate the positive solution of $x^2-2=0$.
Start with $x_0=1$ and find x_2.

Q3. Evaluate the indefinite integrals;

i. $\int\left(\sin(2x)-\cos(\pi)\right)dx$ *ii*. $\int\dfrac{1}{x}dx$ *iii*. $\int\left(\dfrac{1}{k^2+x^2}\right)dx$

Q4. Find f if $f''=e^{-x}$ and $f'(\ln 2)=-\dfrac{1}{2}$, $f(0)=1$