Math 1A

Test 1 - Extra Credit

Show all your work on engineering paper. NO CAS!

1. Evaluate the following limits. What does each limit tell you about functional behavior? (1 point each)

   a) $\lim_{x\to -3} \dfrac{x^3+27}{2x^2+7x+3}$

   b) $\lim_{x\to -4} \dfrac{x+4}{1-\sqrt{x+5}}$

   c) $\lim_{x\to -\infty} \dfrac{4x}{\sqrt{36x^2+3}}$

   d) $\lim_{x\to 7^+} \dfrac{-x^2+5}{x^2-5x-14}$

   e) $\lim_{x\to +\infty} \left(\sqrt{9x^2+4x+1}-3x\right)$

2. Consider the functions below. Find all derivatives by using the short cut formulas. (1 point each)

   a) If $f(x)=\dfrac{Rx^3-Sx^2+T}{\sqrt{x}}$, find $f'(x)$.

   b) Find $\dfrac{dy}{dx}|_{x=-1}$, where $y=2\sqrt[3]{x}\cdot e^x$.

   c) If $g(x)=\dfrac{f(x)}{4x^2+5x+1}$ where $f(2)=-3$ and $f'(2)=6$, find $g'(2)$.

   d) If $H(t)=\dfrac{t^3\cdot e^t}{1+t^2}$, find $H'(t)$.

   e) If $f(x)=\dfrac{-4\sqrt{x}+6}{e^x}$, find $f'(4)$.