

**MATH 1007 E – Test 2**  
Wednesday, October 17th, 2012

NAME: \_\_\_\_\_

STUDENT NUMBER: \_\_\_\_\_

**This test has 4 questions (worth a total of 20 marks). Calculators are not allowed. You have 50 minutes. Write your answers in the spaces provided and put a box around the final answers where appropriate.**

1. (4 points) Find the vertical and horizontal asymptotes of  $y = f(x) = \frac{2x^2 + 1}{x^2 - 5x - 6}$ .

2. (6 points) Find the following limits.

(a)  $\lim_{x \rightarrow 2^-} \frac{x^2 - 4}{(x - 2)^2}$

(b)  $\lim_{x \rightarrow \infty} \frac{4x + 7}{7x^2 + 8}$

(c)  $\lim_{x \rightarrow \infty} \frac{4x^3 + 6x + 7}{7x^2 + 8}$

3. (5 points) Use the definition of the derivative to find  $f'(x)$  if  $f(x) = \sqrt{x+1}$ .

4. (5 points) Find the (first) derivatives of the following functions.

(a)  $f(x) = 2x^2 + 4x^{1/3} - 5e^x + 2$

(b)  $g(t) = \frac{e^t}{t^2 + 2}$

oops - there is a sign mistake here



(c)  $y = (x^2 + 3x + 2)(2x^2 + x + 1)$