MATH 1351-H03 Exam I September 25, 2001

Answer the problems on separate paper. You do <u>not</u> need to rewrite the problem statements on your answer sheets. Do your own work. Show all relevant steps which lead to your solutions. Retain this question sheet for your records.

1. [9pts] Solve $|5 - 3t| = 7$.

2. [9pts] Find the equation of the line which is perpendicular to the line given by $4x - 3y = -2$ and which passes through the point (-2,3).

3. [9pts] PSAT verbal scores for 10th grade sophomores in Texas in 1994 were 547 and in 2000 were 563. Assume that the increase in PSAT verbal scores can be modeled linearly. Find:

   a. A linear equation to model the PSAT verbal scores.

   b. Predict from the model what the PSAT verbal scores will be in 2004.

   c. According to the linear model, when will the PSAT verbal scores reach 580?

4. [9pts] Identify the domain of the function $f(x) = \dfrac{x\sqrt{x+3}}{x-2}$

5. [9pts] Find and simplify $\dfrac{f(x+h) - f(x)}{h}$ for $f(x) = 3x^2 - 4x$.

6. [9pts] Classify each of the following functions as even, odd or neither:

   a. $f(x) = \dfrac{1}{3x^2-4}$ b. $g(x) = \dfrac{1}{6x^2+x}$

7. [9pts] Consider the function $y = f(x) = 6 - 2x$. Find the inverse function f^{-1}. Graph f and f^{-1} on the same coordinate system.

8. [9pts] Simplify $\cos(2\sin^{-1} x)$.

9. [9pts] Solve $2^{x^2 - x} = 64$.

10. [11pts] Find the following limit using a tabular approach: $\lim\limits_{x \to 0} \dfrac{\sin x - x}{x^2}$. Show appropriate supporting steps and data.

11. [11pts] Find the following limit using a graphical approach: $\lim\limits_{x \to 0} \dfrac{e^{\frac{x^3}{12}} - 1}{\sin x - x}$. Show appropriate supporting steps and data.