date: the 18th of September, 1998

place: room 221 Hayes

time: 8:30-9:20

111 - Exam I

This exam contains 10 problems worth 10 points each. You may use only a blank sheet of paper, a pencil, a rubber gum eraser, a ruler and a small calculator. You can use your calculator only to add, substract, multiply or divide two numbers. This exam is taken under the honor code.

Name:

Recommendation

Never give a "solitaire" answer without justifying it by previous calculations or reasoning.

Problems

1. Calculate $f'(25)$ if $f(x) = 2x^{1.5}$.

2. Write down the equation of the line passing through the points $(1, 2)$ and $(3, -4)$, and draw this line as accurate as possible.

3. Decide whether the lines $y = 2x - 1$ and $y = -\frac{1}{2}x + 3$ are parallel, perpendicular or neither, and calculate the coordinates of an intersection point.

4. Simplify as much as possible the following algebraic expression:

$$\frac{x^{\frac{1}{2}} y^3 x^2}{y^2 x^{\frac{3}{2}}}$$

5. Factor the polynomial $x^2 - 7x + 5$. (*Hint: First use the quadratic formula to find the roots.*)

6. Calculate and bring to the simplest form you can the composition $f(g(x))$ where $f(x) = x^2 + 3x + 1$ and $g(x) = x - 2$.

7. An amount of \$1783 is deposited at 4.5% interest per year. If this interest is computed monthly, what will be the amount after 2 years?

8. Let $f(x) = x^2 - 2x + 3$ be a function, and let M be a point on the graph of this function having one coordinate $x = 2$. Write down the equation of the tangent line to the graph at M. (*Hint: First calculate the y-coordinate of M, and the slope of the graph at M.*)

9. Let $f(x) = \frac{2}{x-1}$ be a function. Calculate $f'(3)$ using the definition with limits.

10. Suppose that a vehicle is traveling on a line and its position function is given by $s = 3t^2 - t + 5$ feet, where t is time in seconds. Calulate the velocity and the acceleration at $t = 2$ seconds. (*Hint: First calculate the velocity and the acceleration at any instant.*)

Good luck!