Math 120 D **Quiz 1** (25 minutes) Tuesday, October 7, 1997

Name _____ **Student number** _____ **Quiz section:** _____

Please **show your work** for full credit.

1. Suppose the air pressure is 5 lbs./feet^3 at sea level and is 3 lb./feet^3 at 2 miles above sea level. Find an equation relating the air pressure P (in lbs./feet^3) and the elevation x (in miles above sea level), assuming they are linearly related.

2. A circle of radius 5 meters is cut horizontally at 3 meters above the center. Find the length x of the cut.

3. A child tosses a ball from a height of 2 feet above the ground. The path of the ball is a parabola given by $y = -\frac{1}{8}x^2 + 2x + 2$, where y is the height (in feet) and x is the horizontal distance (in feet) traveled by the ball.

(a) What is the maximum height of the ball?

(b) How far away from the child does the ball land on the ground?

(c) A fence of height 9 feet is located at a horizontal distance of 6 feet from the child. Does the ball clear the fence?

[Quadratic formula: $ax^2 + bx + c = 0$ has solutions $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.]