

Math 120AB - Autumn 2003
Mid-Term Exam Number One
January 29, 2004

Name: _____

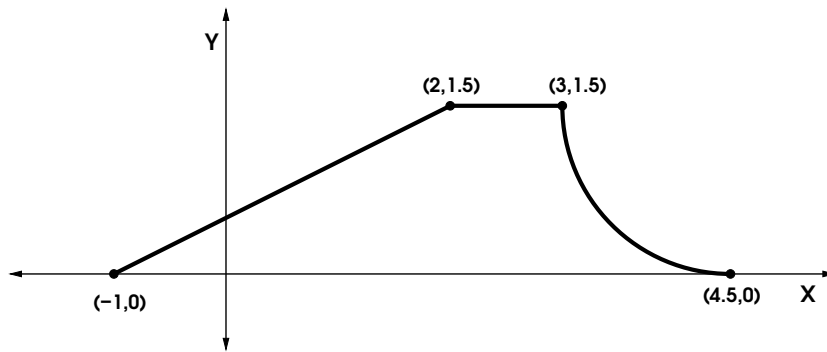
Section: _____

1	10	
2	10	
3	10	
4	10	
5	10	
Total	50	

- Complete all questions.
- You may use a calculator during this examination. Other calculating devices are not allowed.
- If you use a trial-and-error or guess-and-check method, or read a numerical solution from a graph on your calculator when an algebraic method is available, you will not receive full credit.
- You may use one hand-written 8.5 by 11 inch page of notes.
- Show all work for full credit.
- You have 50 minutes to complete the exam.

1. On Canary Island, there were 22,000 canaries in the year 1935. In 1950, there were 25,400. Assume that the number of canaries is a linear function of time.
In what year will there be twice as many canaries as there were in 1985?

2. Here is the graph of a function, $g(x)$:



The graph consists of two line segments and a quarter-circle arc.

(a) Write the multipart rule for $g(x)$.

(b) Find all solutions to the equation

$$g(x) = 0.2.$$

3. Stan is planning to ride his mountain bike across the Circular Desert. He intends to take a straight-line route from a point 50 miles due south of the center of the desert to a point 60 miles north and 30 miles west of the center. The desert is a circular region with a radius of 40 miles.

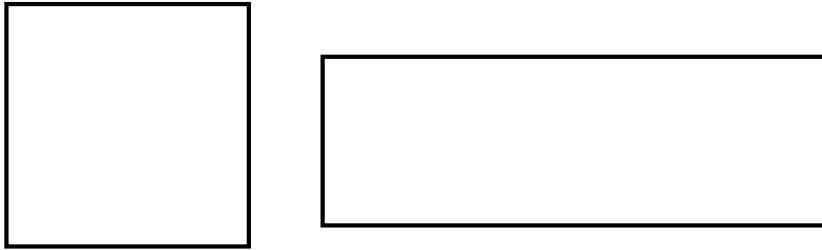
How close will Stan get to the center of the desert?

4. Find the constant(s) d so that the graph of the quadratic function

$$f(x) = (x + d)(x + 6d) + 1$$

has its vertex on the x -axis.

5. You have 100 meters of fencing with which to make two enclosures. One enclosure will be square, and the other will be rectangular, with its long side three times the length of its short side. For example, the enclosures might look like this:



What should the dimensions of the square be to get the least possible total combined area?