

Mathematics 122 Test #1

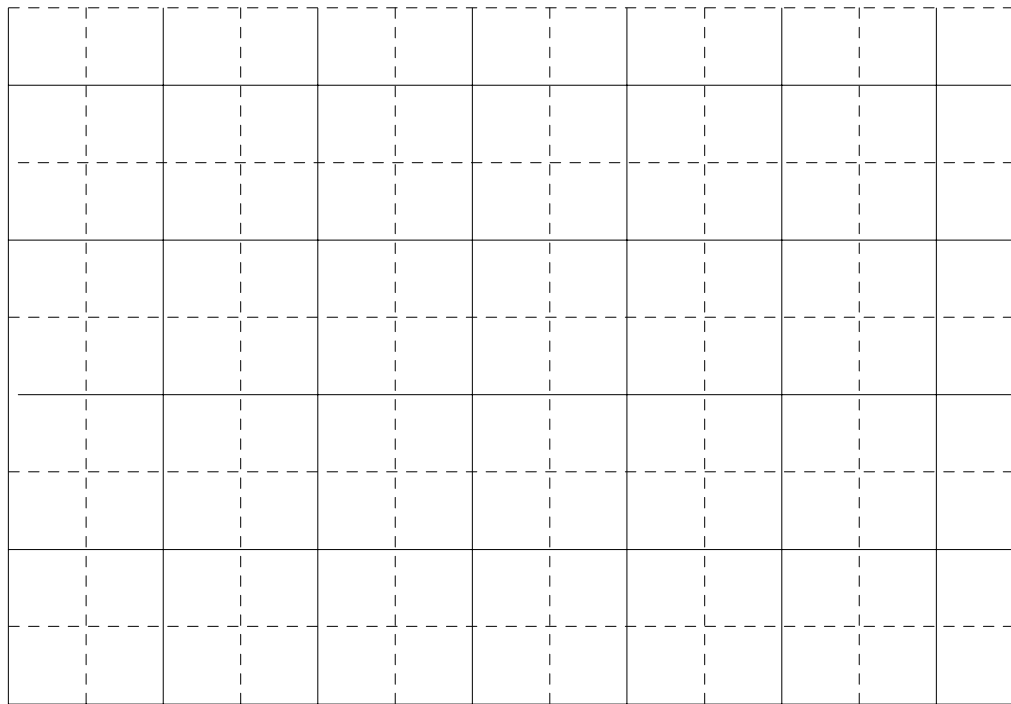
Name: _____

You are to use your own calculator, no sharing.

Show your work to get credit. This means that if you use your calculator to solve a problem, then you have to write a sentence telling how you used it to do the calculations. (That is if you graphed it and zoomed in then say that is what you did etc.

1. (10 points.) A runner starts her workout by jogging slowly for 10 minutes. She then runs fast for 20 minutes but then catches up with a friend who is a slow runner. She runs with him for 15 minutes then as a warm down walks for the final 5 minutes of her workout. Draw a graph of here speed as a function of the time in minutes after she started her workout.

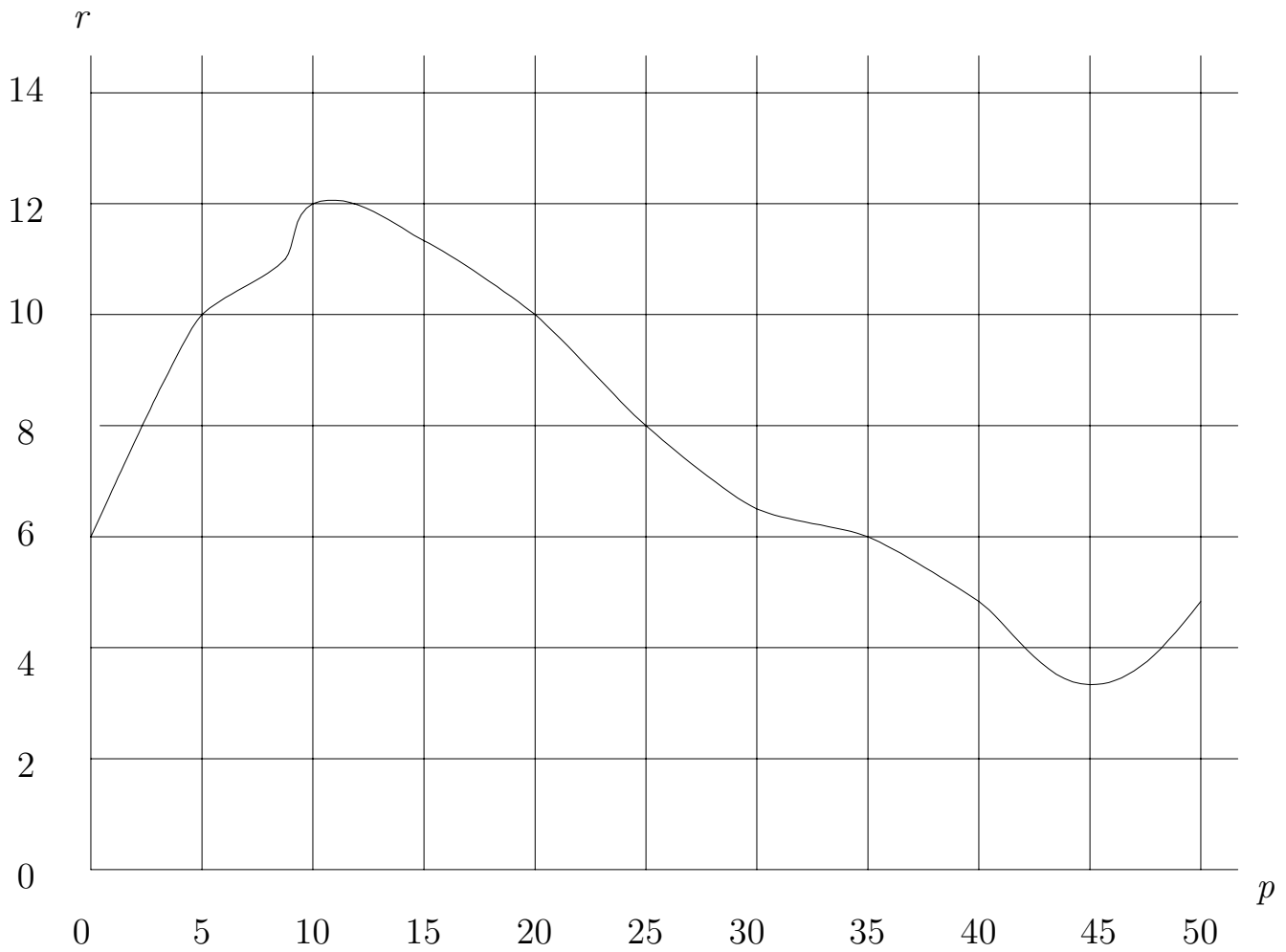
Speed



10 20 30 40 50 60

Time in minutes

2. (10 points) The following is a graph of r as function of p .



(a) What is the value of r when $p = 35$?

(b) For what values of p is $r = 10$?

(c) What is the average rate of change of r with respect to p between $p = 20$ and $p = 35$?

3. (5 points) Find the slope, x -intercept, and y -intercept of the line $3x + 4y - 9 = 0$

Slope= _____

x -intercept= _____

y -intercept= _____

4. (5 points) Find the equation of the line through $(1, -2)$ with slope $\frac{1}{2}$.

5. (10 points) Corresponding values of p and q are given by the table:

p	1	2	3	4
q	1	4	7	10

Assuming that the relationship between p and q is linear

(a) Find q as a linear function of p

(b) Find p as a linear function of q

(c) Find the value of p when $q = 20$

$p =$ _____

6. (15 points) In 1990 there were 500 acres of kudzu growing in Richland county and by 1995 this had increased to 720 acres.
- (a) What is the average rate of change in the number of acres of kudzu between 1990 and 1995? Give the units on your answer.

- (b) Predict how many acres of Kudzu will be growing in Richland county in the year 2000.

- (c) Make a prediction of what year there will be 1000 acres of kudzu in Richland county.

7. (10 points) The cost function for a company to produce a quantity q of some item is $C(q) = 5000 + 3q$ dollars. The revenue function for selling a quantity q of the item is $R(q) = 7q$ dollars.
- (a) What are the fixed costs to the company in producing the items?

- (b) At what price per item is the company selling the items?

- (c) How many items must the company sell to start to make a profit?

8. (10 points) Use your calculator to find a solution to $p^5 + 2p - 4 = 0$ accurate to two decimal places. Write a sentence explaining how you used the calculator in solving the problem.

9. (10 points) The following table gives the some of the values of an exponential function $y = f(x)$.

x	1	2	3	4
$f(x)$	2.10	1.47	1.03	.720

(a) What is the factor by which $f(x)$ changes when x is increased by 1?

(b) What is the value of y when $x = 0$?

$f(0) =$ _____

(c) What is a formula for $y = f(x)$ as a function of x ?

$f(x) =$ _____

10. (15 points) A group of 35 rabbits is released on an island. It is found that this population of rabbits increases at 20% per year.

(a) What is a formula for the number of rabbits after t years?

(b) What is the number of rabbits after 50 years?

(c) How long does it take for the number of rabbits to double?
