

**Take Home Quiz 1**

Official name (printed):

Preferred name to be called:

UIN:

NetID:

**Authorization to return graded papers:**

Quizzes will be vertical-line folded with the grade inside the fold. Exams will have the grade on an inside page. Both quizzes and exams to be returned will be placed in piles at the front of the room alphabetized by last name. Please indicate which one of the following is true:

\_\_\_\_\_ I agree to have my papers returned in this manner.

\_\_\_\_\_ I do not agree to have my papers returned in this manner. Instead, I will pick up my papers in my instructor's office during official office hours after they are returned to the rest of the class.

Signature: \_\_\_\_\_

1. A person will build a fence to enclose a rectangle of 2400 square feet. The front of the fence is made of a material priced at \$20 per linear foot. The other three sides are made of a material priced at \$12 per foot of length. Find the cost of the fence as a function of the length of the front.

Steps: Draw the rectangle and label the side lengths as x or y.

Find the cost as a function of the two variables x and y.

Use the fact that the area is 2400 to eliminate one of the variables.

### NOAA's National Weather Service

#### Heat Index

Temperature (°F)

	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

2. (a) Find the linear regression for the heat index as a function of the relative humidity at 80 degrees Fahrenheit (the leftmost column).

(b) If the relative humidity increases by 10% at 80 degrees Fahrenheit, how much does the heat index increase by?

3. A drug is eliminated from the body at a rate proportional to the amount present. A person took 16 mg at 7 pm on March 1. At 7pm on March 9 there were 4 mg remaining in the body.

a) Write the formula for the amount remaining  $t$  days past 7 pm on March 1.

b) How much was left at 7 am on March 3? Round to 2 decimal places.

4. Find the domain of  $f(x) = \sqrt{9 - x^2} + \frac{1}{1 - x}$ .

5. A person invests \$10000 into an account earning 4% annual interest compounded continuously. The accumulated amount at the end of  $t$  years is

$$A(t) = 10000e^{0.04t}$$

In how many years, rounded to 3 decimal places, will the accumulated amount be \$25000?