

Name _____

Student ID # _____

Class Section _____

Instructor _____

Math 1030
Summer 2008

Final EXAM

Dept. Use Only Exam Scores		
Problem	Points	Score
1.	20	
2.	20	
3.	20	
4.	20	
5.	20	
Extra Credit.	10	
	TOTAL	

Show all your work and make sure you justify all your answers.

(d) A window consists of 4 foot by 6 foot rectangle capped by a semi-circle that is attached to a side of length 4. What is the perimeter and area of this object?

(f) Find the area of an object obtained from a 4 foot by 5 foot rectangle with a triangle removed from the center of the rectangle. The triangle has a base of 2 feet and height of 2 feet.

(g) What is the dimension of a point ? What about a sphere?

2. Conversions and Percents. Do two of the following problems.

(a) Convert 20 square feet to square meters.

(b) A recipe calls for 20 ounces of cauliflower. How many pounds and kilograms of cauliflower does this recipe ask for?

(c) Suppose that the average exam 1 score was a 80 and you scored 15 percent below the average score, and on exam 2 your score was 10 percent higher than your exam 1 score. What was your score on exam 1 and 2?

(d) If the cost of milk was 2.15 dollars and is now 3.10 dollars what is the absolute and relative difference in price?

3. Finance. Do two of the following problems. (Be careful and make sure that you are using the correct formula.)

(a) You owe 25,000 dollars to a credit card company. What is your monthly payment if you wanted to pay off your debt in 3 years versus 6 years? What are the advantages and disadvantages of paying it off in 3 versus 6 years?

(b) If you invest 3500 dollars a year into an account paying 10 percent interest how much money will you have in 10 years. What is the doubling time of your money. Write an equation describing the amount of money you have as a function of time.

- (c) Your adorable 8 year old daughter tells you she wants to go the Yale when she turns 18 year old. You estimate that yale will cost 100,000 dollars for an education. Suppose you find an account that pays 6 percent interest and compounds monthly. How much do you need to invest each month to send your daughter to Yale?

4. Modeling. Do two of the following problems.

- (a) Find the equation of the line that passes through the point $(1, 1)$ and $(3, 4)$. Sketch its graph, label x and y intercepts.

(b) If a snowplow has a maximum speed of 30 miles per hour on a dry highway. Its maximum speed decreases by $\frac{1}{2}$ per hour for every inch of snow on the highway. According to this model, at what snow depth will the plow be unable to move?

(c) If a city has a growth rate of 10 percent what is the doubling time, the equation that describes the population at any time t , and graph this equation.

5. Logarithms. Do the following problems.

(a) Solve the equation for x , $\log(x + 2y) - y + 199 = 0$

(b) Solve the equation for x , $10^{x+2} = 1000000$

6. More geometry

- (a) imagine that a star has the same size of the sun (in diameter), but is located 10 light years away. What is the star's angular size given that 1 light year is about 10^{13} kilometers. If the hubble space telescope can see the details of stars with an angular size of $\frac{1}{360000}$ of a degree can the hubble space telescope see any details of this star?
- (b) To get to a cabin you have the choice of either riding a bicycle west from a parking lot along the edge of a rectangular reservoir for 1.2 miles and then south for .9 miles or rowing a boat directly from the parking lot which is the faster rout given that you ride 1.5 times as fast as you row?
- (c) A man 6 feet tall has a shadow of length 5 feet. If his sister is 5.5 feet tall how long is her shadow. (Assume similar triangles).