## UMUC <br> Math 103 <br> Final Exam - Practice

- You have two and a half hours to complete this exam
- The examination has 20 questions.
- This is a closed book, closed notes examination.
- You may use a calculator on the examination.
- A formula sheet and a statistical table are available from your instructor should you not have your copy with you.

1) Solve: $2(2 x-4)=9-2(x+1)$
2) A 30-year-old worker plans to retire at age 65 . He believes that $\$ 500,000$ is needed to retire comfortably. How much should be deposited now at $3.5 \%$ compounded monthly to meet the $\$ 500,000$ retirement goal?
3) A muffin recipe calls for $3 / 4$ cups sugar for 3 dozen muffins. How much sugar will you use to make 8 dozen?
4) Weights of the Pacific yellowfin tuna follow a normal distribution with mean 68 pounds and standard deviation 12 pounds. What percent of the trout have a weight of less than 50 pounds?
5) The function $\mathrm{C}(x)=.76 x+171.4$ models the cholesterol level of a person, as a function of his age $x$, in years.
a) Compute $\mathrm{C}(20)$
b) Interpret the answer.
6) Given the equation of a line $4 x-2 y=8$
a) Find the $x$-intercept.
b) Find the $y$-intercept.
c) Find the slope.
d) Graph the line.
7) A car can be rented from Continental Rental for $\$ 80$ per week plus 25 cents for each mile driven. How many miles can you travel if you can spend at most $\$ 400$ for the week?
8) You are taking a multiple choice test that has 5 questions. Each of the questions has three answer choices, with one correct answer per question. If you select one of these three choices for each question and leave nothing blank, in how many ways can you answer the questions?
9) A farmer wants to find out about the relationship between the amount of rain in March and crop yield in June.

| March Rainfall in inches $x$ | 3 | 7 | 2 | 6 | 5 |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Crop yield in bushels per <br> acre $y$ | 5 | 12 | 4 | 10 | 6 |

a) Set up a scatter diagram for the data.
b) Does there appear to be a positive linear correlation, negative linear correlation, or no linear correlation?
10) The formula $N=\frac{t^{2}-t}{2}$ describes the number of football games, $N$, that must be played in a league with $t$ teams if each team is to play every other team once. Use this information to find the number of teams that belong to a league which has 36 games scheduled, assuming that each team plays every other team once.
11) A baseball franchise is owned by three people. The first owns $5 / 12$ of the franchise. The seconds owns $1 / 3$. What fraction of the franchise is owned by the third person?
12) Given the function $f(x)=x^{2}+2 x-3$
a) Find the vertex.
b) Find the $x$-intercepts.
c) Find the $y$-intercept.
d) Graph the function.
13) A class is collecting data on eye color and gender. They organize the data they collected into the table below. Numbers in the table represent the number of students from the class that belong to each of the categories.

|  | Brown | Blue | Green |
| :--- | :---: | :---: | :---: |
| Male | 22 | 18 | 10 |
| Female | 18 | 20 | 12 |

Find the probability that a randomly selected student from this class
a) Does not have brown eyes.
b) Has brown eyes or blue eyes.
c) Is female or has green eyes.
d) Is male, given the student has blue eyes.
14) The population $P$ of bass in a lake is predicted by the function $P(t)=\frac{3600}{1+7 \mathrm{e}^{-0.05 t}}$ where $t$ is time in months since the lake was initially stocked. Evaluate $P(12)$ and explain what this means.
15) At age 25 you decide to put aside $\$ 80$ each month into a retirement annuity that pays $2.5 \%$ compounded monthly.
a) How much will you have saved after 40 years?
b) Find the interest.
16) The price of a home is $\$ 180,000$. The bank requires a $20 \%$ down payment for a 15 -year mortgage at $4 \%$.
a) Find the monthly payment.
b) Find the total interest paid.
17) Two McDonald's Quarter Pounders and three Burger King Whoppers with cheese contain 520 milligrams of cholesterol. Three Quarter Pounders and one Whopper with cheese contain 353 milligrams of cholesterol. Determine the cholesterol content in each item.
18) There are 22 cars in the parking lot. Robert wants to find some statistical data concerning these cars and finds out how old these cars are. The results can be read from the following frequency polygon.

a) Find the modal car age
b) Find the median car age
c) Find the mean age of the cars
d) Find the standard deviation of the ages of the cars
19) The names of 10 men and 7 women are entered in a sweepstakes drawing. Two names are drawn at random in succession. What is the probability that
a) the first name is a man's and the second is a woman's?
b) both names are women's?
20) The function $f(x)=110.5 \cdot(1.13)^{x}$ can be used to model the number of cell phone subscribers in the Unites States from 2000 through 2007, where $f(x)$ represents the number of cell phone subscribers in millions, $x$ years after 2000. Evaluate and interpret $f(4)$.

