Math 106 Fall 2008 Name_____
Quiz 6 Semester Review Each problem worth 3 1/3 points.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Which of the following points satisfy the linear inequality $2x + 4y \le 7$?
A) (0, 2)
B) (2, 4)
C) (-1, 3)
D) (1, 1)
E) none of the above

2) The result of performing the elementary row operation [2] + (-1) [3] on the system $\left[\begin{array}{ccc|c} 1 & 0 & 3 & 9 \\ 0 & 1 & -3 & 2 \\ 0 & -5 & 4 & 1 \end{array}\right]$ is

A) $\left[\begin{array}{ccc|c} 1 & 0 & 3 & 9 \\ 0 & 6 & -7 & 1 \\ 0 & -5 & 4 & 1 \end{array}\right]$.

B) $\left[\begin{array}{ccc|c} 1 & 0 & 3 & 9 \\ 0 & -7 & 2 & 0 \\ 0 & -5 & 4 & 1 \end{array}\right]$.

C) $\left[\begin{array}{ccc|c} 1 & 0 & 3 & 9 \\ 0 & 1 & -3 & 2 \\ 0 & -7 & 2 & 0 \end{array}\right]$.

D) $\left[\begin{array}{ccc|c} 1 & 0 & 3 & 9 \\ 0 & -1 & -3 & 2 \\ 0 & -4 & -7 & 1 \end{array}\right]$.

3) $\begin{bmatrix} 1 \\ 3 \\ -2 \end{bmatrix}$ [4 0 6] =

A) $\begin{bmatrix} 4 \\ 0 \\ -12 \end{bmatrix}$

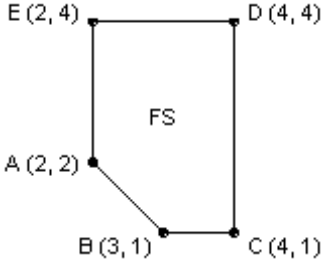
B) [4 0 -12]

C) [-8]

D) $\begin{bmatrix} 4 & 0 & 6 \\ 12 & 0 & 18 \\ -8 & 0 & -12 \end{bmatrix}$

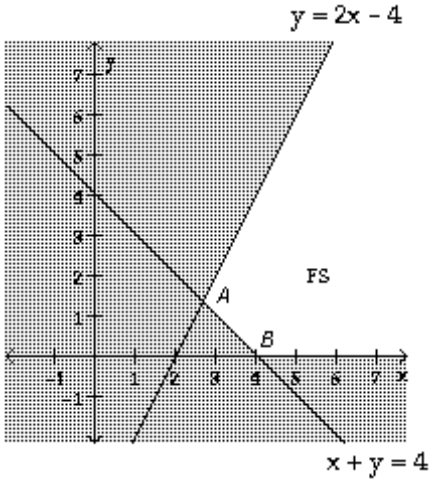
E) $\begin{bmatrix} 4 & 12 & -8 \\ 0 & 0 & 0 \\ 6 & 18 & -12 \end{bmatrix}$

4) Consider the feasible set (FS) below of a certain linear programming problem.



The objective function $5x - y$ is maximized at point
A) *A.* B) *B.* C) *C.* D) *D.* E) *E.*

5) Consider the feasible set, FS, shown below.



The coordinates of vertex *A* are

A) (2, 2).

B) $(\frac{8}{3}, \frac{4}{3})$.

C) $(\frac{8}{3}, 1)$.

D) $(2, \frac{4}{3})$.

E) none of the above

A coffee merchant sells two blends of coffee. Each pound of blend *A* contains 80% Mocha Java and 20 % Jamaican and sells for $2 a pound. Each pound of blend *B* contains 35% Mocha Java and 65% Jamaican and sells for $2.25 a pound. The merchant has available 1000 pounds of Mocha Java and 600 pounds of Jamaican. The merchant will try to sell the amount of each blend that maximizes her income. Let *x* be the number of pounds of blend *A* and *y* be the number of pounds of blend *B*.

6) In the situation above, the objective function is

A) $2.25x + 0.2y$.

B) $0.35x + 2y$.

C) $1000x + 600y$.

D) $0.80x + 0.20y$.

E) none of the above

7) Since the merchant above has available 1000 pounds of Mocha Java, one inequality that must be satisfied is

A) $0.8x + 0.35y \leq 1000$.

B) $0.8x + 0.35y \geq 1000$.

C) $0.35x + 0.65y \geq 1000$.

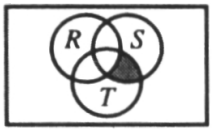
D) $0.8x + 0.2y \leq 1000$.

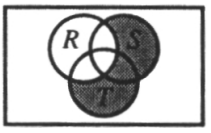
E) none of the above

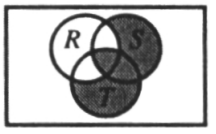
Consider the following sets.
$U = \{1, 2, 3, 4, 5, 6, 7, 8\}$
$A = \{2, 4, 6, 8\}$
$B = \{1, 2, 3, 5, 7\}$

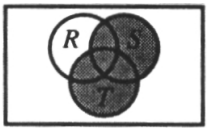
8) $A' \cup B$ is the set
   A) {1, 3, 5,7}
   B) {4, 6, 8}.
   C) $\emptyset$.
   D) {2}.
   E) none of the above

9) In which Venn diagram does the shaded portion represent $R' \cap (S \cup T)$?

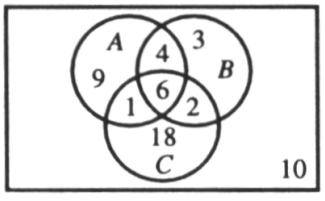
A) 

B) 

C) 

D) 

10) Consider the Venn diagram below.



$n(A \cup B)' =$
   A) 28.
   B) 40.
   C) 50.
   D) 39.
   E) none of the above

11) In how many ways can a hand of five cards be dealt from an ordinary deck of 52 cards?`
   A) $\frac{52!}{5!}$
   B) $52 \cdot 51 \cdot 50 \cdot 49 \cdot 48$
   C) $\frac{52!}{5!\,47!}$
   D) 47!
   E) none of the above

12) How many ways can the 30 members of the Young Democrats elect a president, vice-president, secretary, and treasurer?

A) 26!

B) $\frac{30!}{4!}$

C) $\frac{30!}{26!}$

D) $\frac{30 \cdot 29 \cdot 28}{4 \cdot 3 \cdot 2}$

E) none of the above

13) An exam contains 5 multiple-choice questions, each having 4 possible answers. In how many different ways can the exam be completed?

A) $5 \cdot 4 \cdot 3 \cdot 2$

B) C(5, 4)

C) 5^4

D) 4^5

E) none of the above

14) The probability of getting either a black card or an ace in one draw from an ordinary deck of 52 cards is

A) $\frac{26}{52}$.

B) $\frac{30}{52}$.

C) $\frac{29}{52}$.

D) $\frac{28}{52}$.

E) none of the above

15) Five horses are running at a race track. Being an inexperienced bettor, you assume that every order of finish is equally likely. You bet that Son-of-a-Gun will win and that Gentle Lady will come in second. The probability that you will win both bets is

A) $\frac{9}{20}$.

B) $\frac{1}{20}$.

C) $\frac{2}{5}$.

D) $\frac{1}{25}$.

E) none of the above

16) Find the median of the numbers: 8 3 14 11 6

A) 8 B) 6.5 C) 14 D) 8.5 E) 8.4

17) Consider the probability distribution below.

k	$\Pr(X = k)$
-2	0.1
0	0.2
1	0.1
2	0.2
3	0.4

The mean is

A) 1.0.
B) 3.0.
C) 1.5.
D) 0.8.
E) none of the above

18) If X has a normal distribution with $\mu = 5$ and $\sigma = 2$, then $\Pr(2 \le X \le 6)$ is

A) 0.2417.
B) 0.6247.
C) 0.9772.
D) 0.7583.
E) none of the above

19) The IQ of adults in a certain large population is normally distributed with mean 100 and standard deviation 10. If a person is chosen at random from this group, the probability that the person's IQ is less than 85 or greater than 110 is

A) 0.2255.
B) 0.0919.
C) 0.9081.
D) 0.7745.
E) none of the above

20) What is the compound amount after five years of $100 deposited at 10% interest compounded annually?

A) $161
B) $162
C) $122
D) $121
E) none of the above

21) You buy a car with a down payment of $300 and payments of $200 per month for 3 years. If the interest rate is 12% compounded monthly, what is the total cost of the car?

A) $6321.50
B) $5532.14
C) $6574.20
D) $8615.38
E) none of the above

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

The table below gives the distribution of blood type by sex in a group of 1000 individuals.

Blood Type	Male	Female	Total
O	80	370	450
A	150	250	400
B	50	50	100
AB	20	30	50
Total	400	600	

A person is selected at random from this group.

22) Based on the table above, what is the probability that the person selected is male?

23) Based on the table above, what is the probability that the person selected is a female with blood type O?

24) Based on the table above, what is the probability that the person selected is female if the person's blood type is O?

Solve the problem.

25) An exam contains six "true or false" questions. What is the probability that a student guessing at the answers will get exactly four correct?

26) From the following frequency distribution, construct a relative frequency distribution.

Number	Frequency
0	4
1	6
2	2
3	5

27) Calculate the future value of an annuity of $200 per month for five years at 12% interest compounded monthly.

Negate the statement.

28) Susan fixed the car and finished her homework.

Construct a truth table for the statement.

29) $\sim(p \wedge \sim q)$

Solve the problem.

30) Graph the equation $2x - 5y = -10$.