

Name _____

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

A manufacturer of wooden chairs and tables must decide in advance how many of each item will be made in a given week. Use the table to find the system of inequalities that describes the manufacturer's weekly production.

- 1) Use x for the number of chairs and y for the number of tables made per week. The number of work-hours available for construction and finishing is fixed. 1) _____

	Hours per chair	Hours per table	Total hours available
Construction	2	3	36
Finishing	2	2	28

A) $2x + 3y \geq 28$

B) $2x + 3y \leq 36$

C) $2x + 3y \geq 36$

D) $2x + 3y \leq 28$

$2x + 2y \geq 36$

$2x + 2y \leq 28$

$2x + 2y \geq 28$

$2x + 2y \leq 36$

$x \geq 0$

$x \geq 0$

$x \geq 0$

$x \geq 0$

$y \geq 0$

$y \geq 0$

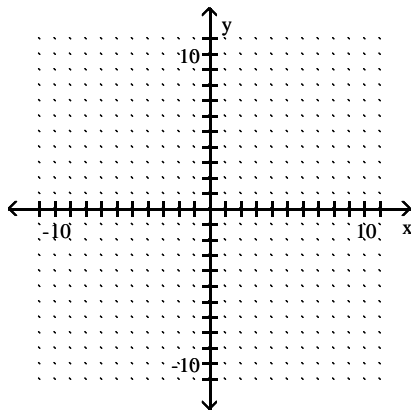
$y \geq 0$

$y \geq 0$

Use graphical methods to solve the linear programming problem.

- 2) Minimize $z = 6x + 8y$
 subject to:
 $2x + 4y \geq 12$
 $2x + y \geq 8$
 $x \geq 0$
 $y \geq 0$

2) _____



A) Minimum of 26 when $x = 3$ and $y = 1$

B) Minimum of 0 when $x = 0$ and $y = 0$

C) Minimum of $\frac{92}{3}$ when $x = \frac{10}{3}$ and $y = \frac{4}{3}$

D) Minimum of 36 when $x = 6$ and $y = 0$

Provide an appropriate response.

- 3) A linear program is defined with constraints $7x + 5y \geq 8$, $3x + 2y \geq 0$, $x \geq 0$, and $y \geq 0$. Is the feasibility region bounded, unbounded, or empty? 3) _____

A) Unbounded

B) Empty

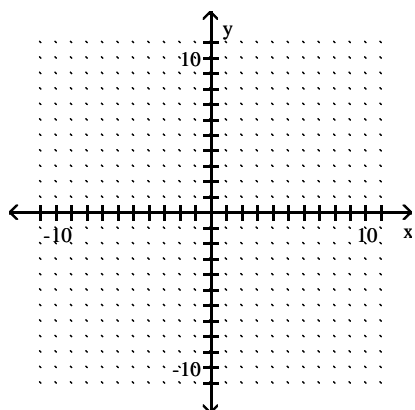
C) Bounded

The Acme Class Ring Company designs and sells two types of rings: the VIP and the SST. They can produce up to 24 rings each day using up to 60 total man-hours of labor. It takes 3 man-hours to make one VIP ring, versus 2 man-hours to make one SST ring.

- 4) How many of each type of ring should be made daily to maximize the company's profit, if the profit on a VIP ring is \$40 and on an SST ring is \$35? 4) _____
- A) 18 VIP and 6 SST B) 12 VIP and 12 SST
C) 14 VIP and 10 SST D) 16 VIP and 8 SST

Use graphical methods to solve the linear programming problem.

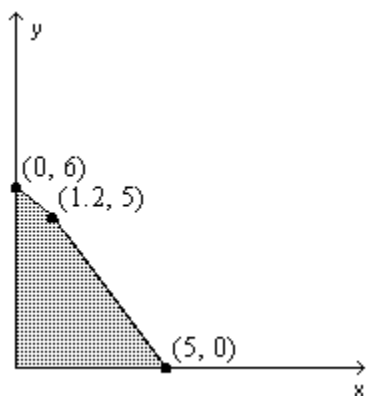
- 5) Maximize $z = 6x + 7y$ 5) _____
subject to: $2x + 3y \leq 12$
 $2x + y \leq 8$
 $x \geq 0$
 $y \geq 0$



- A) Maximum of 32 when $x = 3$ and $y = 2$ B) Maximum of 52 when $x = 4$ and $y = 4$
C) Maximum of 32 when $x = 2$ and $y = 3$ D) Maximum of 24 when $x = 4$ and $y = 0$

Find the value(s) of the function on the given feasible region.

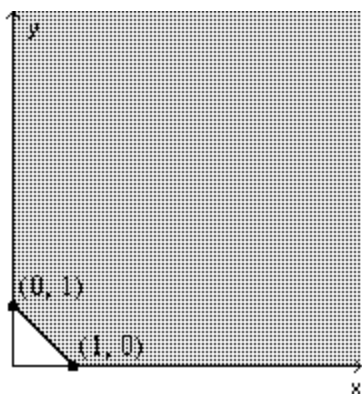
- 6) Find the maximum and minimum of $z = 5x - 17y$. 6) _____



- A) 25, -102 B) 25, 0 C) -102, 0 D) -78.75, -102

7) Find the minimum of $z = 14x + 10y$.

7) _____



A) 10

B) 25

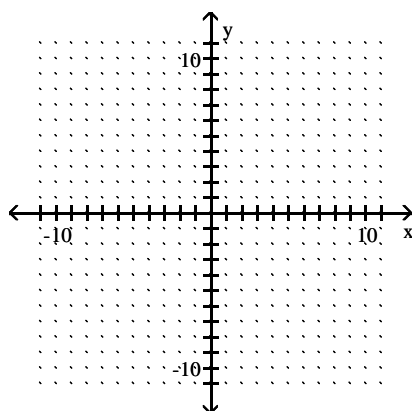
C) 49

D) 39

Use graphical methods to solve the linear programming problem.

8) Minimize $z = 2x + 4y$
 subject to:
 $x + 2y \geq 10$
 $3x + y \geq 10$
 $x \geq 0$
 $y \geq 0$

8) _____



A) Minimum of 20 when $x = 2$ and $y = 4$

B) Minimum of 20 when $x = 2$ and $y = 4$, as well as when $x = 10$ and $y = 0$, and all points in between

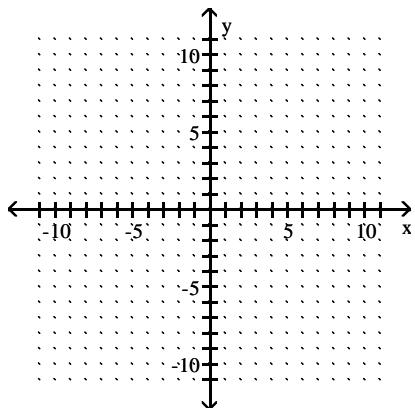
C) Minimum of 0 when $x = 0$ and $y = 0$

D) Minimum of 20 when $x = 10$ and $y = 0$

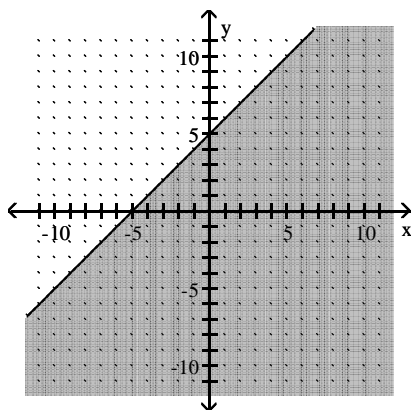
Graph the linear inequality.

9) $y \leq -x + 5$

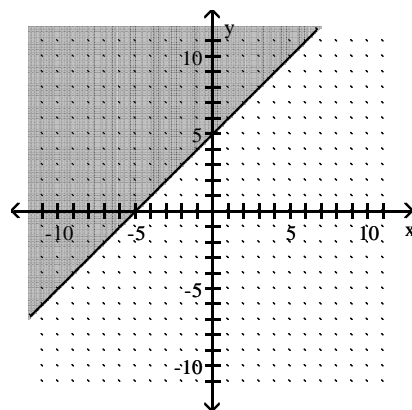
9) _____



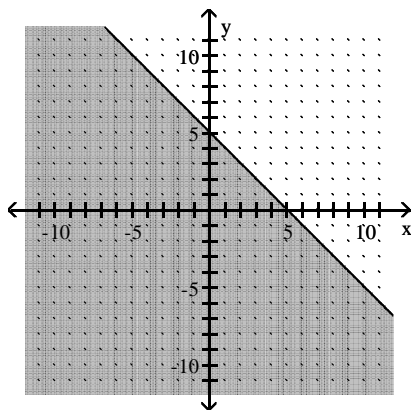
A)



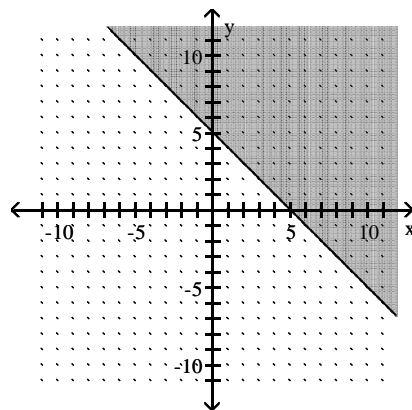
B)



C)



D)

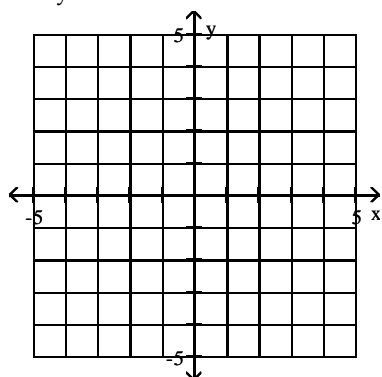


Graph the feasible region for the system of inequalities.

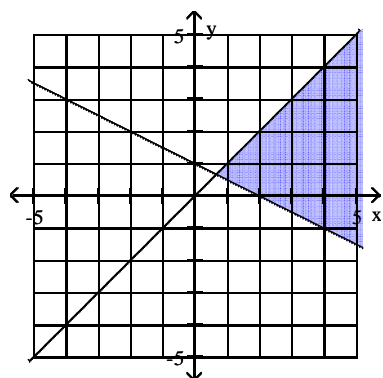
10) $x + 2y \leq 2$

$x + y \geq 0$

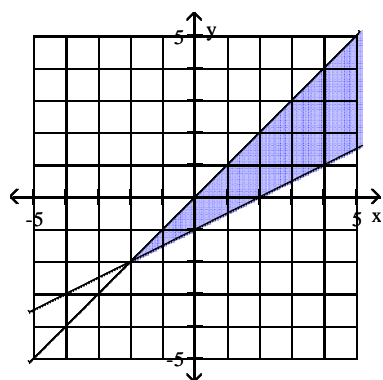
10) _____



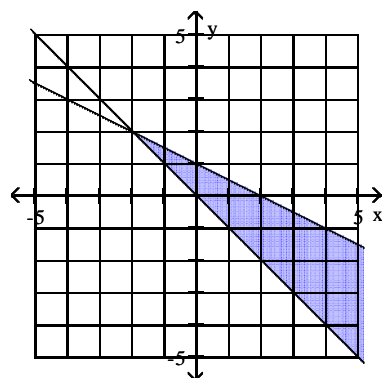
A)



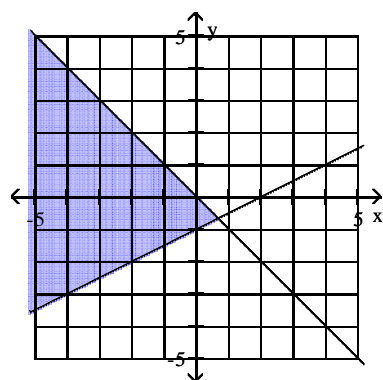
C)



B)



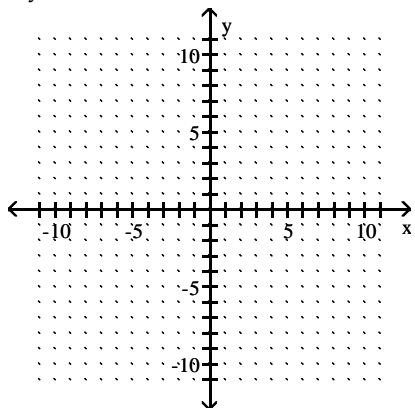
D)



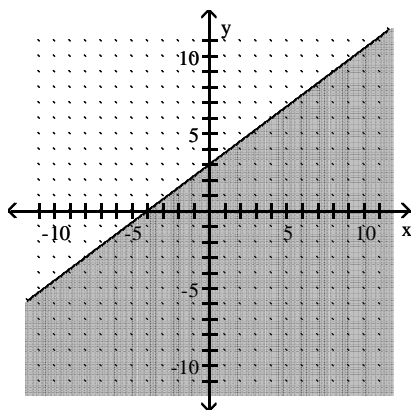
Graph the linear inequality.

11) $3x + 4y \leq 12$

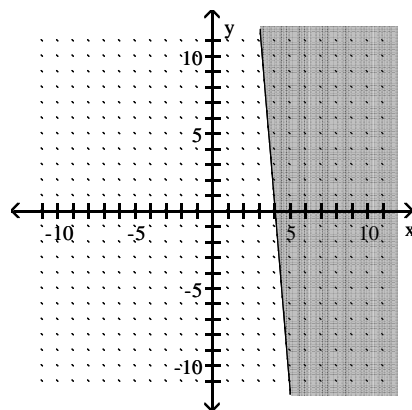
11) _____



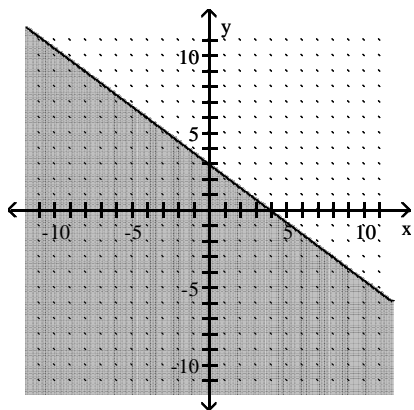
A)



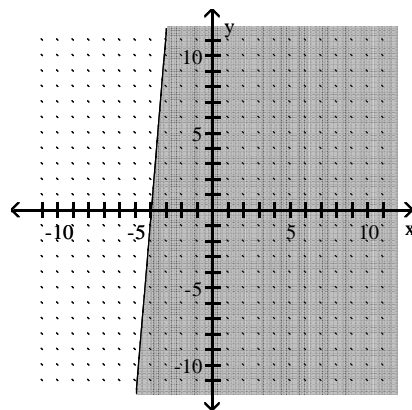
B)



C)



D)



A manufacturer of wooden chairs and tables must decide in advance how many of each item will be made in a given week. Use the table to find the system of inequalities that describes the manufacturer's weekly production.

- 12) Use x for the number of chairs and y for the number of tables made per week. The number of work-hours available for construction and finishing is fixed. 12) _____

	Hours per chair	Hours per table	Total hours available
Construction	3	5	45
Finishing	3	3	30

- A) $5x + 3y \leq 45$
 $3x + 3y \leq 30$
 $x \geq 0$
 $y \geq 0$
- B) $5x + 3y \leq 30$
 $3x + 3y \leq 45$
 $x \geq 0$
 $y \geq 0$
- C) $3x + 5y \leq 45$
 $3x + 3y \leq 30$
 $x \geq 0$
 $y \geq 0$
- D) $3x + 5y \leq 45$
 $3x + 3y \leq 30$
 $x \leq 0$
 $y \leq 0$

Let $U = \{\text{all soda pops}\}$; $A = \{\text{all diet soda pops}\}$; $B = \{\text{all cola soda pops}\}$; $C = \{\text{all soda pops in cans}\}$; and $D = \{\text{all caffeine-free soda pops}\}$. Describe the given set in words.

- 13) $A \cap B$ 13) _____
- A) All diet and all cola soda pops
 B) All diet or all cola soda pops
 C) All soda pops
 D) All diet-cola soda pops

Let $U = \{q, r, s, t, u, v, w, x, y, z\}$; $A = \{q, s, u, w, y\}$; $B = \{q, s, y, z\}$; and $C = \{v, w, x, y, z\}$. List the members of the indicated set, using set braces.

- 14) $C' \cap A'$ 14) _____
- A) $\{q, s, u, v, w, x, y, z\}$
 B) $\{r, t\}$
 C) $\{q, r, s, t, u, v, x, z\}$
 D) $\{w, y\}$

The lists below show five agricultural crops in Alabama, Arkansas, and Louisiana.

<u>Alabama</u>	<u>Arkansas</u>	<u>Louisiana</u>
soybeans (s)	soybeans (s)	soybeans (s)
peanuts (p)	rice (r)	sugarcane (n)
corn (c)	cotton (t)	rice (r)
hay (h)	hay (h)	corn (c)
wheat (w)	wheat (w)	cotton (t)

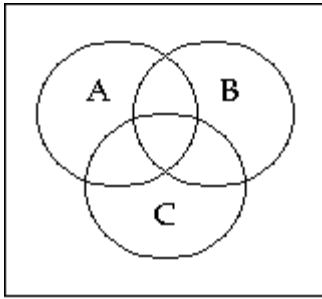
Let U be the smallest possible universal set that includes all of the crops listed; and let A , K , and L be the sets of five crops in Alabama, Arkansas, and Louisiana, respectively. Find the indicated set.

- 15) $A' \cap K'$ 15) _____
- A) $\{n\}$
 B) \emptyset
 C) $\{c, p, r, t\}$
 D) $\{c, n, p, r, t\}$

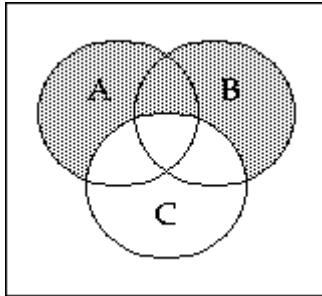
Shade the Venn diagram to represent the set.

16) $C' \cap (A \cup B)$

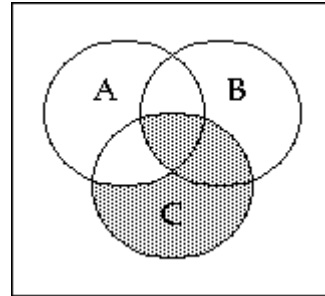
16) _____



A)



B)



For the experiment described, write the indicated event in set notation.

17) A die is tossed twice with the tosses recorded as an ordered pair. Represent the following event as a subset of the sample space: The first toss shows a four.

17) _____

A) $\{(4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6)\}$

B) $\{(4, 1), (4, 3), (4, 5)\}$

C) $\{(4, 1), (4, 2), (4, 4), (4, 5), (4, 6)\}$

D) $\{(4, 3)\}$

A die is rolled twice. Write the indicated event in set notation.

18) The sum of the rolls is either 8 or 11, and one roll is a 5.

18) _____

A) $\{(5, 3), (3, 5)\}$

B) $\{(3, 5), (6, 5)\}$

C) $\{(5, 3), (5, 6)\}$

D) $\{(5, 3), (5, 6), (3, 5), (6, 5)\}$

For the experiment described, write the indicated event in set notation.

19) A die is tossed twice with the tosses recorded as an ordered pair. Represent the following event as a subset of the sample space: The sum of the tosses is seven, and one toss is a six.

19) _____

A) $\{(1, 6)\}$

B) $\{(6, 1), (1, 6)\}$

C) $\{(6, 1)\}$

D) \emptyset

20) From six job applicants, two people are selected for an interview. The names of the applicants are Ruth, Kim, Nancy, Jeff, Mark, and Lisa. Represent the event "Lisa is selected" as a subset of the sample space.

20) _____

A) $\{\text{Lisa, Ruth}\}$

B) $\{\text{L and R, L and K, L and N, L and J, L and M, L and L}\}$

C) $\{\text{L and R, L and K, L and N, L and J, L and M}\}$

D) $\{\text{Lisa}\}$

Suppose $P(C) = .048$, $P(M \cap C) = .044$, and $P(M \cup C) = .524$. Find the indicated probability.

21) $P(M' \cap C')$

21) _____

A) .564

B) .956

C) .568

D) .476

Solve the problem.

- 22) If two cards are drawn without replacement from an ordinary deck, find the probability that the second card is a spade, given that the first card was a spade. 22) _____
- A) $\frac{11}{12}$ B) $\frac{4}{17}$ C) $\frac{11}{51}$ D) $\frac{3}{13}$

Assume that two marbles are drawn without replacement from a box with 1 blue, 3 white, 2 green, and 2 red marbles.

Find the probability of the indicated result.

- 23) The second marble is white, given that the first marble is blue. 23) _____
- A) $\frac{3}{56}$ B) $\frac{3}{64}$ C) $\frac{3}{8}$ D) $\frac{3}{7}$
- 24) One marble is green, and one marble is red. 24) _____
- A) $\frac{1}{2}$ B) $\frac{3}{28}$ C) $\frac{1}{4}$ D) $\frac{1}{7}$

Find the probability.

- 25) A family has five children. The probability of having a girl is $\frac{1}{2}$. What is the probability of having 2 girls followed by 3 boys? Round the answer to the fourth decimal place. 25) _____
- A) .0313 B) .1875 C) .6252 D) .3125

Use the given table to find the indicated probability.

- 26) College students were given three choices of pizza toppings and asked to choose one favorite. The following table shows the results. 26) _____

toppings	freshman	sophomore	junior	senior
cheese	10	11	28	20
meat	24	20	11	10
veggie	11	10	24	20

P(favorite topping is meat | student is junior)?
Round the answer to the nearest hundredth.

- A) .329 B) .055 C) .175 D) .169

Solve the problem, rounding the answer as appropriate. Assume that "pure dominant" describes one who has two dominant genes for a given trait; "pure recessive" describes one who has two recessive genes for a given trait; and "hybrid" describes one who has one of each.

- 27) In a population, 40% of females are pure dominant, 50% are hybrid, and 10% are pure recessive. If a pure recessive male mates with a random female and their first offspring has the dominant trait, what is the probability that the female is pure dominant? 27) _____
- A) .27 B) .40 C) .44 D) .75

Solve the problem.

- 28) Below is a table of data from a high school survey given to 500 parents. Find the probability that a randomly chosen parent would agree or strongly agree that the school is clean. Round your answer to the nearest hundredth. 28) _____

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The school is safe	81	137	100	119	63
The school is clean	66	157	100	134	43
A) .44	B) .35	C) 177	D) .36		

Suppose $P(C) = .048$, $P(M \cap C) = .044$, and $P(M \cup C) = .524$. Find the indicated probability.

- 29) $P[(M \cup C)']$ 29) _____
 A) .956 B) 0 C) .952 D) .476

Solve the problem.

- 30) A survey revealed that 33% of people are entertained by reading books, 29% are entertained by watching TV, and 38% are entertained by both books and TV. What is the probability that a person will be entertained by either books or TV? Express the answer as a percentage. 30) _____
 A) 62% B) 100% C) 24% D) 38%

Use the union rule to answer the question.

- 31) If $n(A) = 32$, $n(B) = 93$, and $n(A \cup B) = 109$; what is $n(A \cap B)$? 31) _____
 A) 48 B) 8 C) 16 D) 18

Use a Venn Diagram and the given information to determine the number of elements in the indicated set.

- 32) $n(U) = 60$, $n(A) = 26$, $n(B) = 22$, and $n(A \cap B) = 5$. Find $n(A \cup B)'$. 32) _____
 A) 12 B) 17 C) 43 D) 48

Use a Venn diagram to answer the question.

- 33) A survey of 160 families showed that 33) _____
 59 had a dog;
 46 had a cat;
 19 had a dog and a cat;
 63 had neither a cat nor a dog, and in addition did not have a parakeet;
 3 had a cat, a dog, and a parakeet.
 How many had a parakeet only?
 A) 16 B) 11 C) 26 D) 21

Answer Key

Testname: TEST # 2 REVIEW CH. 7&8 MATH 1324 FALL 2010

- 1) B
- 2) C
- 3) A
- 4) B
- 5) A
- 6) A
- 7) A
- 8) B
- 9) C
- 10) B
- 11) C
- 12) C
- 13) D
- 14) B
- 15) A
- 16) A
- 17) A
- 18) D
- 19) B
- 20) C
- 21) D
- 22) B
- 23) D
- 24) D
- 25) A
- 26) C
- 27) C
- 28) B
- 29) D
- 30) C
- 31) C
- 32) B
- 33) B