Exam

Name_____

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

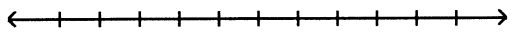
Solve the equation.

1) $\frac{1}{3}(6x - 15) = \frac{1}{4}(20x - 8)$ 1) _____

2) $6[3m - (2m + 6) + 7] = 7m + 3$ 2) _____

Solve the inequality and graph the solution.

3) $8x - 5 \leq 2x - 13$ 3) _____



Find the slope of the line.

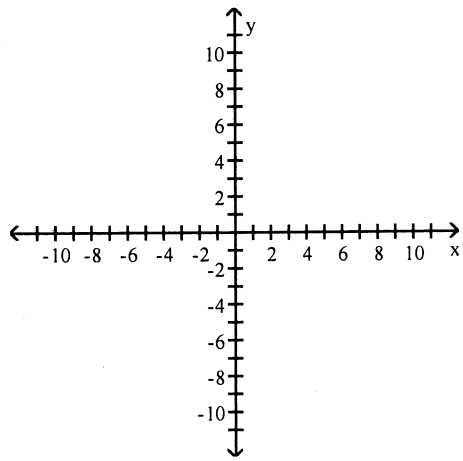
4) $2x - 5y = -42$ 4) _____

Find an equation in slope-intercept form (where possible) for the line.

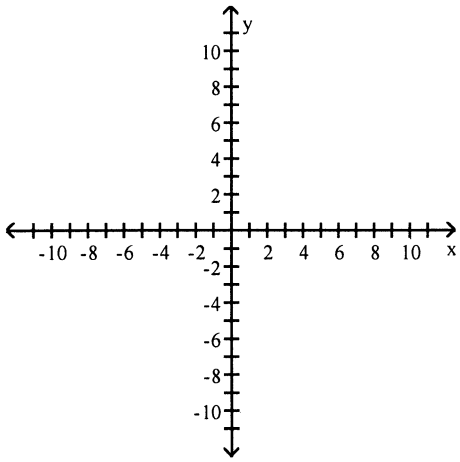
5) Through (3, 4) and (-3, 13) 5) _____

Graph the equation.

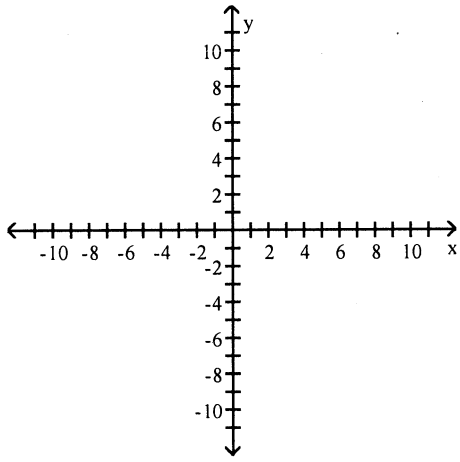
6) $y = -3x - 2$ 6) _____



7) $x - 2 = 0$ 7) _____



8) $y - 2 = 0$ 8) _____



Solve the problem.

9) In a certain city, the cost of a taxi ride is computed as follows: There is a fixed charge of $2.70 as soon as you get in the taxi, to which a charge of $2.10 per mile is added. Find a linear equation that can be used to determine the cost, C, of an x-mile taxi ride. 9) _____

Write a cost function for the problem. Assume that the relationship is linear.

10) A cab company charges a base rate of $2.00 plus 20 cents per minute. Let C(x) be the cost in dollars of using the cab for x minutes. 10) _____

Use Elimination (addition subtraction) or substitution method to solve the system of two equations in two unknowns.

11) $x + 8y = 37$ 11) _____
$7x + 7y = 63$

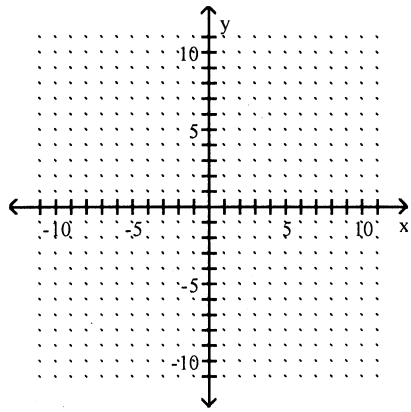
Use the echelon method to solve the system.

12) $\frac{x}{2} + \frac{y}{2} = -1$ 12) _____

$\frac{x}{2} - \frac{y}{2} = -3$

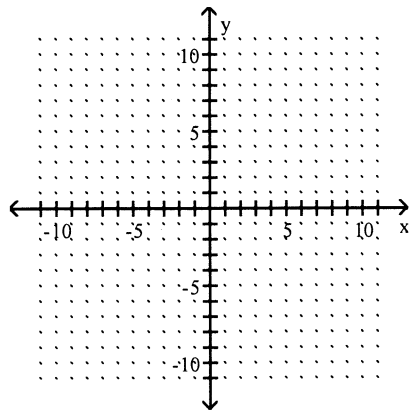
Graph the linear inequality.

13) $-2x - 5y \leq 10$ 13) _____

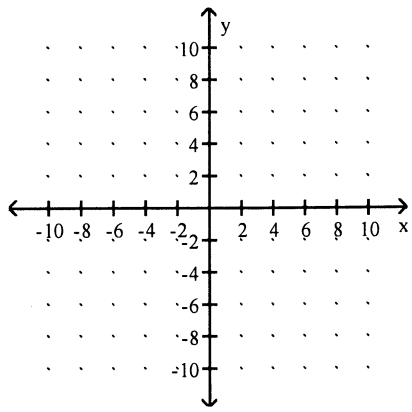


Graph the feasible region for the system of inequalities.

14) $3x + 4y \leq 12$
$x - 3y \leq 3$ 14) _____

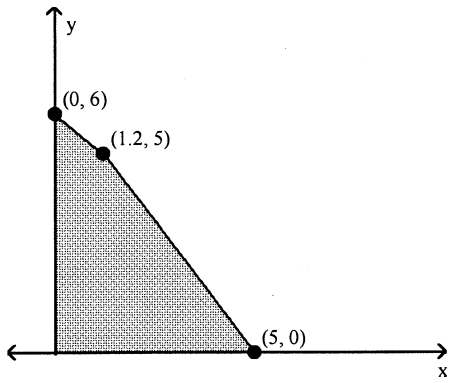


15) $2y + x \geq -2$
$y + 3x \leq 9$
$y \leq 0$
$x \geq 0$ 15) _____



Use the indicated region of feasible solutions to find the maximum and minimum values of the given objective function.

16) $z = 20x - 24y$ 16) _____



Use graphical methods to solve the linear programming problem.

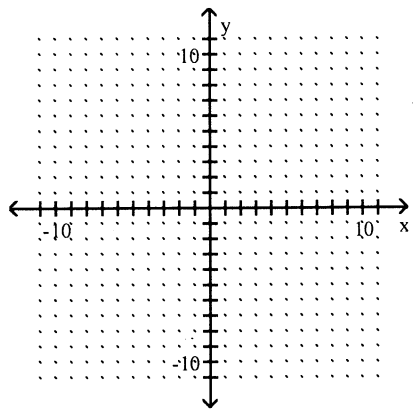
17) Maximize $z = 6x + 7y$ 17) _____

subject to: $2x + 3y \leq 12$

$2x + y \leq 8$

$x \geq 0$

$y \geq 0$



Solve the problem.

18) 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 and 2 man-hours to make one SST ring. 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 $30? 18) _____

Decide whether the following is a statement or is not a statement.

19) $3 + 8 = 12$ 19) _____

Translate the symbolic compound statement into words.

20) Let p represent the statement "Students are males" and let q represent the statement "Teachers are males."

$\sim(p \vee \sim q)$ 20) _____

21) Let p represent the statement "Jello is tasty" and let q represent the statement "Thursday is rectangular." 21) _____

$\sim p \wedge \sim q$

Let p represent the statement "Jim plays football" and let q represent the statement "Michael plays basketball." Convert the compound statement into symbols.

22) It is not the case that Jim does not play football and Michael does not play basketball. 22) _____

Use one of De Morgan's laws to write the negation of the statement.

23) I was a day late and a dollar short. 23) _____

Let p represent "the puppy behaves well," let q represent "the puppy's owners are happy," and let r represent "the puppy is trained." Express the compound statement in words.

24) $(r \wedge p) \rightarrow q$ 24) _____

Let p represent "I eat too much," let q represent "I exercise," and let r represent "the food is good." Write the compound statement in symbols.

25) If the food is good or I eat too much, then I exercise. 25) _____

Construct a truth table for the statement.

26) $(s \rightarrow \sim r) \rightarrow (s \wedge \sim r)$ 26) _____

Use a truth table to decide if the statements are equivalent.

27) $q \wedge \sim p; \sim p \rightarrow \sim q$ 27) _____

For the given direct statement, write the indicated related statement (converse, inverse, or contrapositive).

28) If I pass, then I'll party. (contrapositive) 28) _____

29) All cats catch birds. (inverse) 29) _____

30) If you like me, then I like you. (converse) 30) _____

Construct a truth table for the statement.

31) $(p \wedge \sim q) \leftrightarrow (p \rightarrow q)$ 31) _____

Use a truth table to determine whether the argument is valid or invalid.

32) If I'm hungry, then I will eat. 32) _____

I'm not hungry.

I will not eat.

Use a truth table to determine whether the argument is valid or invalid.

33) $\sim p \rightarrow q$ 33) _____

$\sim q \rightarrow p$

$p \vee q$

Tell whether the statement is true or false.

34) $\{x \mid x \text{ is an even counting number}; 10 \leq x \leq 16\} = \{10, 16\}$ 34) _____

Find the number of subsets of the set.

35) {5, 6, 7} 35) _____

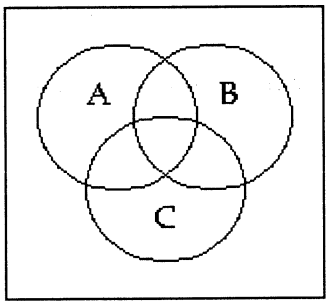
Let U = {q, r, s, t, u, v, w, x, y, z}; A = {q, s, u, w, y}; B = {q, s, y, z}; and C = {v, w, x, y, z}. List the members of the indicated set, using set braces.

36) $A \cap B'$ 36) _____

37) $B' \cap (A \cup C')$ 37) _____

Shade the Venn diagram to represent the set.

38) $(A' \cup B) \cap C$ 38) _____



Use the union rule to answer the question.

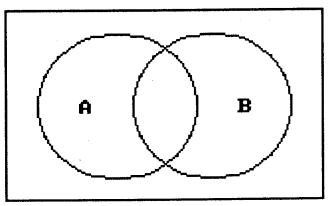
39) If n(B) = 48, $n(A \cap B) = 9$, and $n(A \cup B) = 84$; what is n(A)? 39) _____

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

40) n(U) = 60, n(A) = 28, n(B) = 24, and $n(A \cap B) = 5$. Find $n(A \cup B)'$. 40) _____

Use a Venn diagram to decide if the statement is true or false.

41) $A \cap B' = (A' \cup B)'$ 41) _____



Use a Venn diagram to answer the question.

42) At East Zone University (EZU) there are 509 students taking College Algebra or Calculus. 169 are taking College Algebra, 353 are taking Calculus, and 13 are taking both College Algebra and Calculus. How many are taking Calculus but not Algebra? 42) _____

Write the sample space for the given experiment.

43) A coin is tossed, and then a die is rolled. 43) _____

Find the probability of the given event.

44) Two fair dice are rolled. The sum of the numbers on the dice is 6 or 11. 44) _____

Find the probability.

45) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing a face card or a 6? 45) _____

Find the indicated probability.

46) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing an ace or a 7? 46) _____

47) Two fair dice are rolled. What is the probability that a sum of 6 or 10 is obtained? 47) _____

Use a Venn diagram to find the indicated probability.

48) Suppose P(B) = 0.55, P(C) = 0.48, and P(B ∩ C) = 0.22.
Find P(B' ∪ C'). 48) _____

Find the odds.

49) Find the odds in favor of drawing a red marble when a marble is selected at random from a bag containing 2 yellow, 5 red, and 6 green marbles. 49) _____

An experiment is conducted for which the sample space is S = {a, b, c, d}. Decide if the given probability assignment is possible for this experiment. If the assignment is not possible, tell why.

50) 50) _____

Outcomes	Probabilities
a	0.1
b	0.1
c	0.4
d	0.4

Solve the problem.

51) A survey revealed that 31% of people are entertained by reading books, 50% are entertained by watching TV, and 19% 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. 51) _____

52) The odds in favor of a horse winning a race are posted as 7 : 4. Find the probability that the horse will win the race. 52) _____

53) If two cards are drawn without replacement from an ordinary deck, find the probability that the second card is a face card, given that the first card was a queen. 53) _____

Provide an appropriate response.

54) Let A be the event that it will be sunny this afternoon.
Let B be the event that Francia will go shopping this afternoon. Given that P(A) = 0.7, P(B) = 0.8, and
P(A ∩ B) = 0.2, are events A and B independent? How can you tell? 54) _____

Find the indicated probability.

55) You are dealt two cards successively (without replacement) from a shuffled deck of 52 playing cards. Find the probability that the first card is a king and the second card is a queen. 55) _____

Solve the problem.

56) 53% of a store's computers come from factory A and the remainder come from factory B. 5% of computers from factory A are defective while 3% of computers from factory B are defective. If one of the store's computers is selected at random, what is the probability that it is defective and from factory B? 56) _____

Find the indicated probability.

57) The table below describes the smoking habits of a group of asthma sufferers. 57) _____

	Nonsmoker	Light smoker	Heavy smoker	Total
Men	303	73	76	452
Women	397	81	79	557
Total	700	154	155	1009

If one of the 1009 subjects is randomly selected, find the probability that the person chosen is a nonsmoker given that it is a woman. Round to the nearest thousandth.

Find the probability.

58) Assuming that boy and girl babies are equally likely, find the probability that a family with four children has all boys given that the first is a boy. 58) _____

Solve the problem.

59) How many 5-digit numbers can be formed using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, if repetitions of digits are allowed? 59) _____

60) License plates are made using 2 letters followed by 2 digits. How many plates can be made if repetition of letters and digits is allowed? 60) _____

61) A bag contains 8 apples and 6 oranges. If you select 7 pieces of fruit without looking, how many ways can you get exactly 6 apples? 61) _____

A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability.

62) 2 cherry, 1 lemon 62) _____

63) One of each flavor 63) _____

Solve the problem.

64) At the first tri-city meeting, there were 8 people from town A, 7 people from town B, and 5 people from town C. If the council consists of 5 people, find the probability of 2 from town A, 2 from town B, and 1 from town C. 64) _____

Prepare a probability distribution for the experiment. Let x represent the random variable, and let P represent the probability.

65) Two balls are drawn from a bag in which there are 4 red balls and 2 blue balls. The number of blue balls is counted. 65) _____

Find the expected value for the random variable.

66)

z	3	6	9	12	15
P(z)	0.14	0.02	0.36	0.38	0.10

66) _____

Find the expected value of the random variable in the experiment.

67) Three coins are tossed, and the number of tails is noted. 67) _____

Solve the problem.

68) Suppose you buy 1 ticket for $1 out of a lottery of 1000 tickets where the prize for the one winning ticket is to be $500. What is your expected payback? 68) _____

Find the mean for the list of numbers.

69) 4, 5, 10, 6, 12, 10 (Round to the nearest tenth, if necessary.) 69) _____

Find the mean. Round to the nearest tenth.

70)

Value	Frequency
14	5
19	15
23	7
29	14
32	7

70) _____

Find the median for the list of numbers.

71) 4, 14, 26, 23, 43, 46 71) _____

Find the mode or modes.

72) 69, 25, 69, 13, 25, 29, 56, 69 72) _____

Find the range for the set of numbers.

73) 116, 559, 132, 576, 448, 316 73) _____

Find the standard deviation for the set of numbers.

74) 2, 4, 17, 5, 19, 7, 10, 13, 11 74) _____

Find the percent of the area under a normal curve between the mean and the given number of standard deviations from the mean.

75) -2.91 75) _____

Find the percent of the total area under the standard normal curve between the given z-scores.

76) z = 0.70 and z = 1.98 76) _____

A company installs 5000 light bulbs, each with an average life of 500 hours, standard deviation of 100 hours, and distribution approximated by a normal curve. Find the approximate number of bulbs that can be expected to last the specified period of time.

77) Between 500 hours and 675 hours 77) _____

78) More than 400 hours 78) _____

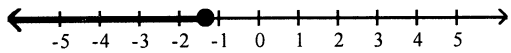
Assume the distribution is normal. Use the area of the normal curve to answer the question. Round to the nearest whole percent.

79) The mean clotting time of blood is 7.35 seconds, with a standard deviation of 0.35 second. What is the probability that blood clotting time will be less than 7.0 seconds? 79) _____

1) -1

2) 3

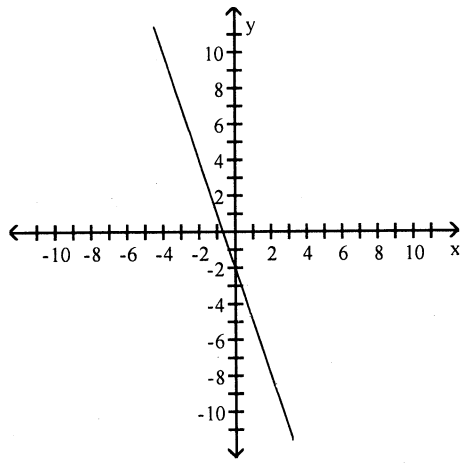
3) $\left(-\infty, -\frac{4}{3}\right]$



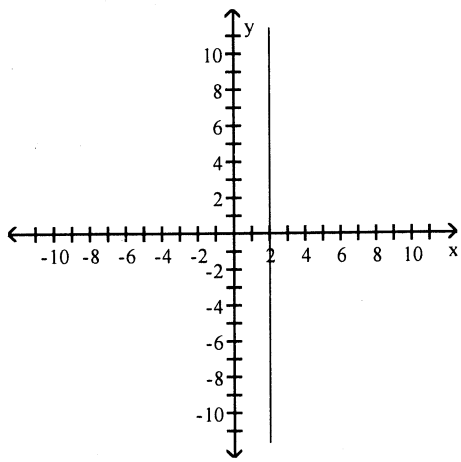
4) $\frac{2}{5}$

5) $y = -\frac{3}{2}x + \frac{17}{2}$

6)



7)



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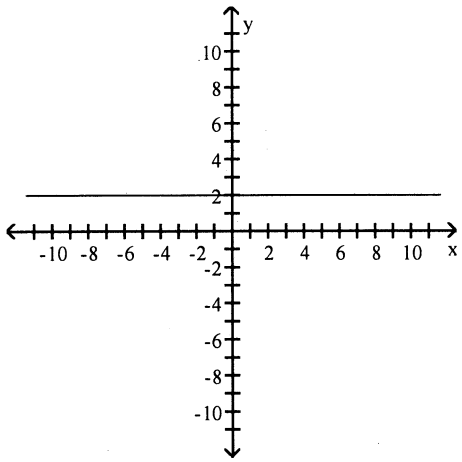


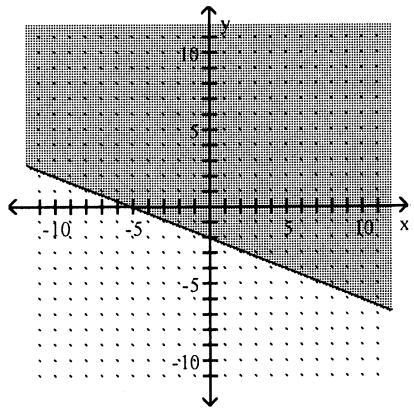
9) $C = 2.10x + 2.70$

10) $C(x) = 0.20x + 2.00$

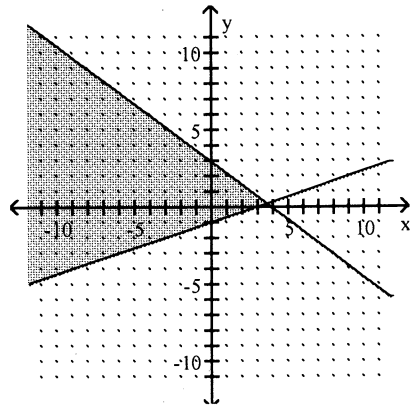
11) (5, 4)

12) (-4, 2)

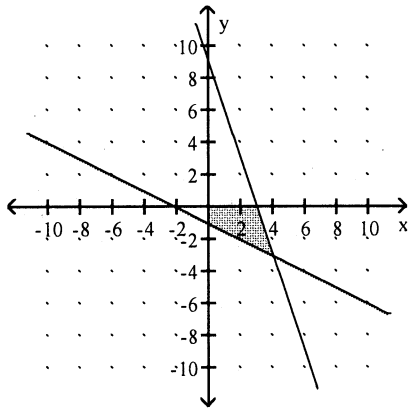
13)



14)



15)



16) Maximum of 100; minimum of -144
17) Maximum of 32 when x = 3 and y = 2
18) 12 VIP and 12 SST
19) Statement
20) It is not the case that students are males or teachers are not males.
21) Jello is not tasty and Thursday is not rectangular.
22) ~(~p ∧ ~q)
23) I was not a day late or not a dollar short.
24) If the puppy is trained and the puppy behaves well, then his owners are happy.
25) (r ∨ p) → q
26)

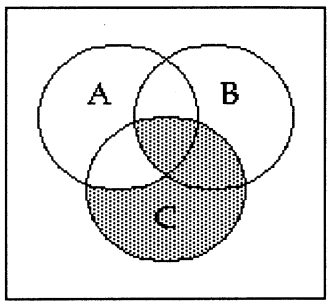
s	r	(s → ~r) → (s ∧ ~r)
T	T	T
T	F	T
F	T	F
F	F	F

27) Not equivalent
28) If I don't party, then I didn't pass.
29) If it's not a cat, then it doesn't catch birds.
30) If I like you, then you like me.
31)

p	q	(p ∧ ~q)	↔	(p → q)
T	T	F	F	T
T	F	T	T	F
F	T	F	F	T
F	F	F	T	T
		(2)	(1)	(3)

32) Invalid; fallacy of the inverse
33) Valid
34) False
35) 8
36) {u, w}
37) {r, t, u, w}

38)



39) 45
40) 13
41) True
42) 340
43) {(h, 1), (h, 2), (h, 3), (h, 4), (h, 5), (h, 6), (t, 1), (t, 2), (t, 3), (t, 4), (t, 5), (t, 6)}
44) $\frac{7}{36}$
45) $\frac{4}{13}$
46) $\frac{2}{13}$
47) $\frac{2}{9}$
48) 0.78
49) 5 to 8
50) Yes
51) 62%
52) $\frac{7}{11}$
53) $\frac{11}{51}$
54) No, because $P(A \cap B) \neq P(A) \cdot P(B)$
55) $\frac{4}{663}$
56) 0.014
57) 0.713
58) $\frac{1}{8}$
59) 100,000 five-digit numbers
60) 67,600 plates
61) 168 ways
62) 0.1818
63) 0.2182
64) 0.189

65)

x	P(x)
0	0.4
1	0.53
2	0.07

66) 9.84
67) 1.5
68) -$0.50
69) 7.8
70) 23.9
71) 24.5
72) 69
73) 460
74) 5.8
75) 49.82%
76) 0.2181
77) 2300
78) 4207
79) 16%