MATH 1630 Name _____
Exam 3 Sample Problems

Solve by the elimination method.

1) $x - 7y = -38$
$-3x - 8y = -31$ 1) _____

2) $7x + 5y = -64$
$3x - 2y = -15$ 2) _____

3) $5x - 6y = 4$
$-10x + 12y = 8$ 3) _____

Solve by the substitution method.

4) $x + 6y = 26$
$6x + 5y = 32$ 4) _____

5) $x - 5y = 25$
$-5x - 4y = 20$ 5) _____

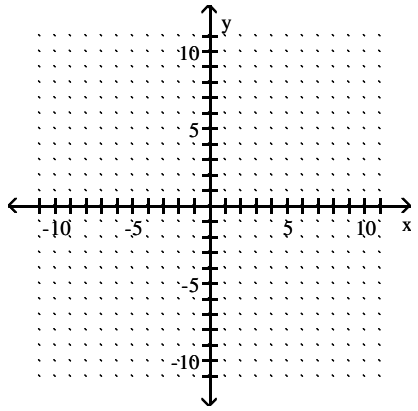
Solve the problem.

6) Ron and Kathy are ticket–sellers at their class play, Ron handling student tickets that sell for $2.00 each and Kathy selling adult tickets for $4.50 each. If their total income for 20 tickets was $60.00, how many did Ron sell? 6) _____

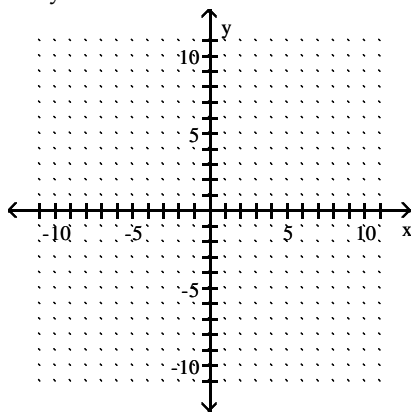
7) There were 28,000 people at a ball game in Los Angeles. The day's receipts were $210,000. How many people paid $12.00 for reserved seats and how many paid $6.00 for general admission? 7) _____

Graph the linear inequality.

8) $x + 4y \geq 6$ 8) _____

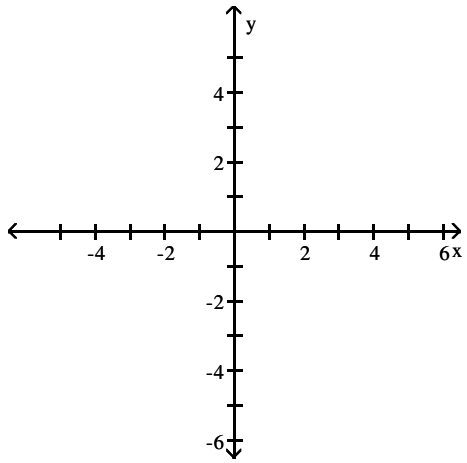


9) $x + y < -5$ 9) _____



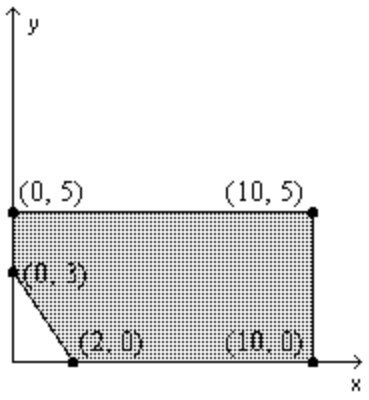
Graph the system of inequalities.

10) $2x - y > 4$ 10) _____
$x \leq 4$



The graph shows a region of feasible solutions. Find the maximum or minimum values of the given expression.

11) Find the maximum and minimum of $20x + 5y$. 11) _____



Solve the linear programming problem.

12) Stan and Ron's hobby is building birdhouses. The number of wren houses cannot exceed 4 times the number of martin houses. They cannot make more than 100 wren houses or more than 50 martin houses. The total production cannot exceed 125. The profit on a wren house is $9.20 and the profit on a martin house is $8.30. Find the maximum profit. 12) _____

Given a group of students: G = {Allen, Brenda, Chad, Dorothy, Eric} or G = {A, B, C, D, E}, list and count the different ways of choosing the following officers or representatives for student congress. Assume that no one can hold more than one office.

13) Three representatives, if two must be male and one must be female 13) _____

14) A president, a secretary, and a treasurer, if the president must be a woman and the other two must be men 14) _____

15) A treasurer and a secretary if the two must not be the same sex 15) _____

Using the 36 possibilities found in the product table for rolling two dice, list and count the outcomes for which the sum (for both dice) is the following.

16) Multiple of 3 16) _____

17) Between 7 and 10 17) _____

18) Greater than 10 18) _____

Evaluate the factorial expression.

19) $\frac{7!}{5!\,2!}$ 19) _____

Evaluate the permutation.

20) ${}_5P_5$ 20) _____

Evaluate the expression.

21) ${}_8C_4$ 21) _____

Solve the problem.

22) How many odd three–digit numbers can be written using digits from the set $\{2, 3, 4, 5, 6\}$ if no digit may be used more than once? 22) _____

23) A computer printer allows for optional settings with a panel of four on–off switches in a row. How many different settings can be selected if no three adjacent switches can all be off? 23) _____

24) Six strangers arrive at a business seminar and each person shakes hands with every other person. How many handshakes are there? 24) _____

25) A restaurant offers salads with 2 types of lettuce, 7 different toppings, and 3 different dressings. How many different salads could be ordered? 25) _____

26) License plates are made using 3 letters followed by 2 digits. How many plates can be made if repetition of letters and digits is allowed? 26) _____

27) How many different 4–letter radio–station call letters can be made if the first letter must be K or W, repeats are allowed, but the call letters cannot end in an O? 27) _____

28) Given a committee of 8 women and 11 men, count the number of different ways of choosing a president, a secretary, and a treasurer, if the president must be a woman and the secretary and treasurer must be men. Assume no one can hold more than one office. 28) _____

29) In a certain lottery, 3 different numbers between 1 and 8 inclusive are drawn. These are the winning numbers. How many different selections are possible? Assume that the order in which the numbers are drawn is not important. 29) _____

30) Four accounting majors, two economics majors, and three marketing majors have interviewed for five different positions with a large company. Find the number of different ways that five of these people could be hired if the first position is to be filled by an accounting major, the second position is to be filled by an economics major, the third position is to be filled by a marketing major, and the last two positions can be filled by any major. 30) _____

31) Four married couples have reserved eight seats in a row at the theater, starting at an aisle seat. In how many ways can they arrange themselves if the four men occupy the four seats closest to the aisle? 31) _____

32) There are 5 women running in a race. How many different ways could first, second, and third place finishers occur? 32) _____

33) A pool of possible jurors consists of 10 men and 12 women. How many different juries consisting of 5 men and 7 women are possible? 33) _____

34) A committee is to be chosen from a group of fourteen women and twelve men. Determine the number of ways of choosing a female president, a male treasurer, and three other members of either gender. Assume that no one can hold more than one office. 34) _____

Provide an appropriate response.

35) Consider the selection of a nominating committee for a club. Is this a combination, a permutation, or neither? 35) _____

A) Permutation B) Combination C) Neither

Solve the problem.

36) If a single card is drawn from a standard 52–card deck, in how many ways could it be an ace or a spade? 36) _____

37) If a single card is drawn from a standard 52–card deck, in how many ways could it be a diamond or a face card? 37) _____

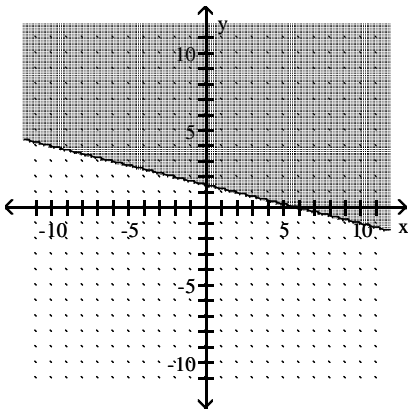
38) If you toss four fair coins, in how many ways can you obtain at least one head? 38) _____

39) If a license plate consists of four digits, how many different licenses could be created having at least one digit repeated. 39) _____

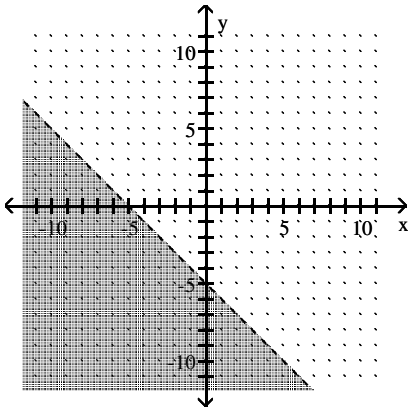
40) A group of five entertainers will be selected from a group of twenty entertainers that includes Small and Trout. In how many ways could the group of five include at least one of the entertainers Small and Trout? 40) _____

41) The chorus has six sopranos and eight baritones. In how many ways can the director choose a quartet that contains at least one soprano? 41) _____

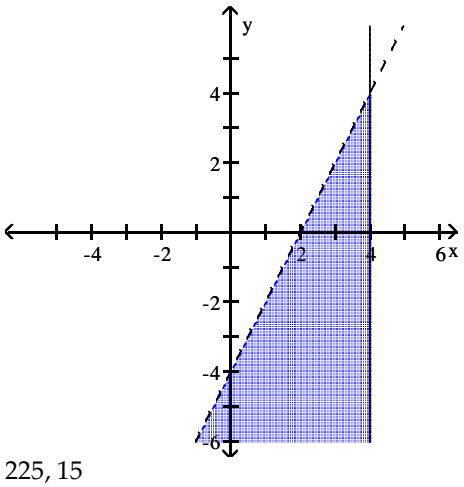
1) {(–3, 5)}
2) {(–7, –3)}
3) No solution
4) {(2, 4)}
5) {(0, –5)}
6) 12 tickets
7) 7000 paid $12 and 21,000 paid $6
8)



9)



10)



11) 225, 15
12) $1127.50

13) ACB, ACD, AEB, AED, CEB, CED; 6
14) BAC, BAE, BCE, DAC, DAE, DCE, BCA, BEA, BEC, DCA, DEA, DEC; 12
15) AB, AD, CB, CD, EB, ED, BA, DA, BC, DC, BE, DE; 12
16) (1,2), (2,1), (2,4), (4,2), (1,5), (5,1), (3,3), (3,6), (6,3), (4,5), (5,4), (6,6); 12
17) (2,6), (6,2), (6,3), (3,6), (5,3), (3,5), (4,4), (4,5), (5,4); 9
18) (6,5), (5,6), (6,6); 3
19) 21
20) 120
21) 70
22) 24
23) 13
24) 15
25) 42
26) 1,757,600
27) 33,800
28) 880
29) 56
30) 720
31) 576
32) 60
33) 199,584
34) 340, 032
35) B
36) 16 ways
37) 22 ways
38) 15 ways
39) 4960 licenses
40) 6936 ways
41) 931 ways