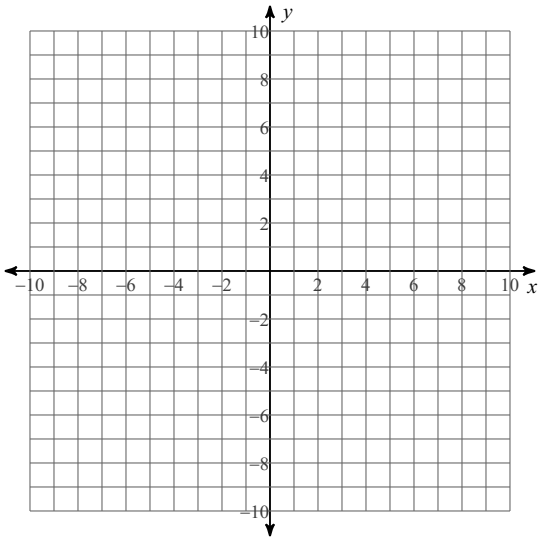
Semester 1 Exam Review

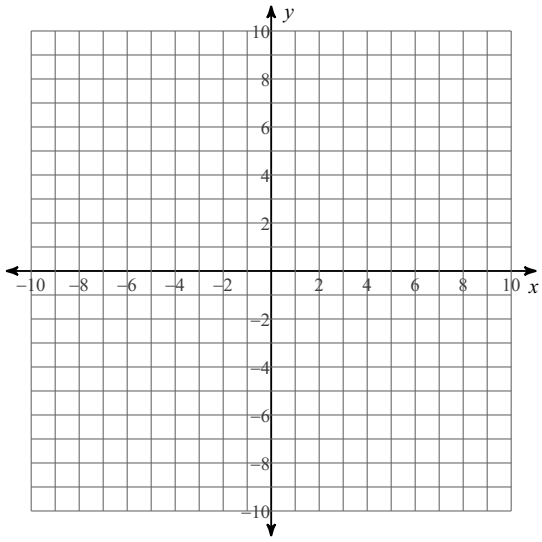
Date_____ Hour____

Solve each system.

1) $y = \frac{9}{8}x - 3$
$y = \frac{1}{8}x + 5$



2) $y = \frac{1}{3}x - 5$
$y = -\frac{1}{3}x - 1$



3) $y = 5x - 4$
$y = 4x - 3$

4) $-5x - 2y = -6$
$y = -2x + 1$

5) $-6x + 7y = 9$
$x - 8y = -22$

6) $-3x - 2y = 2$
$5x - y = 1$

7) $-3x - y = 20$
$-x + y = 8$

8) $-7x + 7y = -12$
$-7x + 7y = -21$

9) $3x - 8y = 24$
$-9x - 4y = 12$

10) $-9x - 3y = 0$
$4x - 5y = 19$

Solve each system by elimination by hand showing all work.

11) $3x - y + 5z = -28$
$4x - y - 5z = -14$
$-3x + y + 5z = 8$

12) $2r + 3s + 5t = -6$
$-3s - 4t = 3$
$-4r - 3s - t = 24$

13) $-3x - 5y + z = -10$
$3x - 3y + 3z = 18$
$-6x - 6y + 3z = -30$

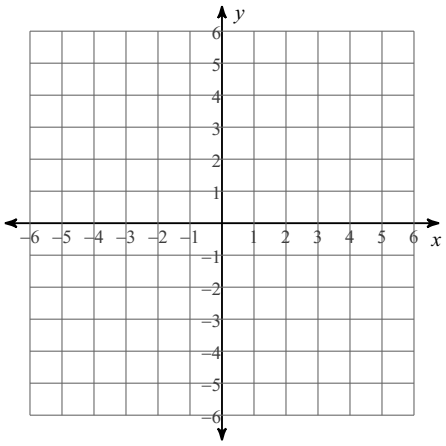
14) $-3r + 5s + 4t = -1$
$-4r + 4s - 2t = -6$
$6r - 2s - 4t = -2$

15) $-a - 3b - c = 5$
$2a + b - c = 7$
$-a + 6b + 2c = -16$

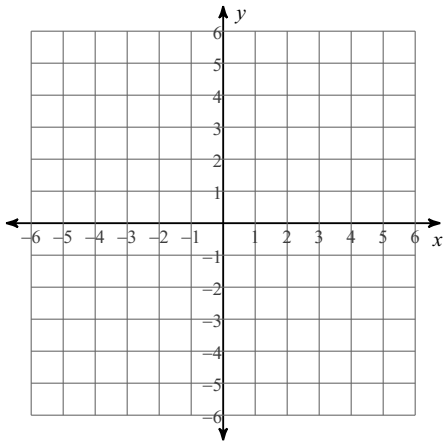
16) $6a - 4b - 6c = 8$
$2a - 4b - 2c = -8$
$a - 6b - 4c = -2$

Sketch the graph of each linear inequality.

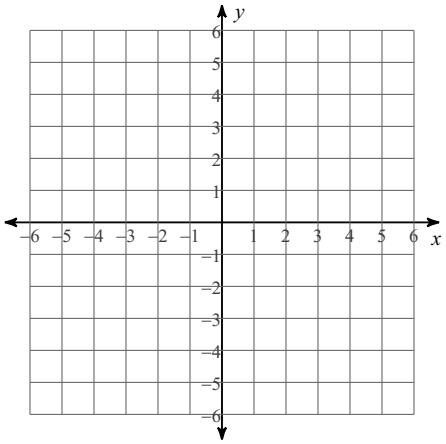
17) $x \leq 4$



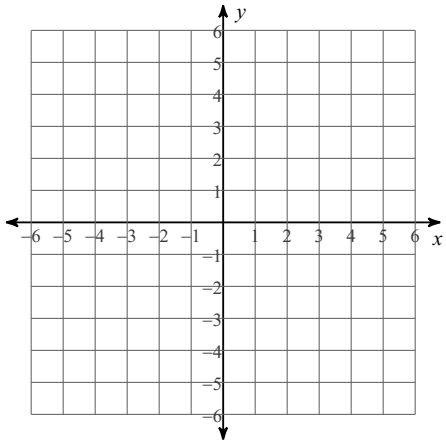
18) $y < -5x + 5$



19) $3x + y > 0$



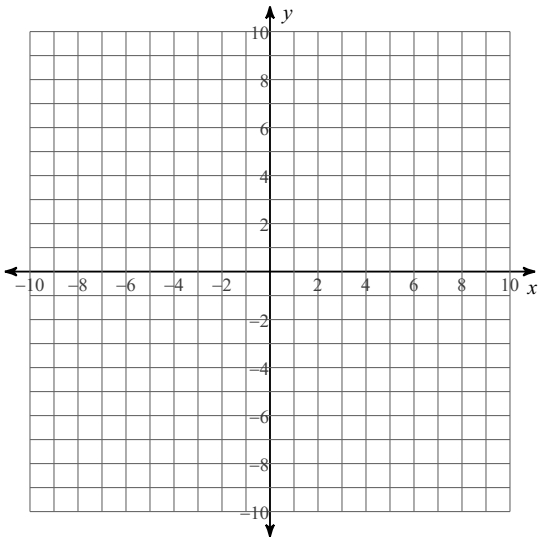
20) $3x + 2y \leq 0$



Sketch the solution to each system of inequalities.

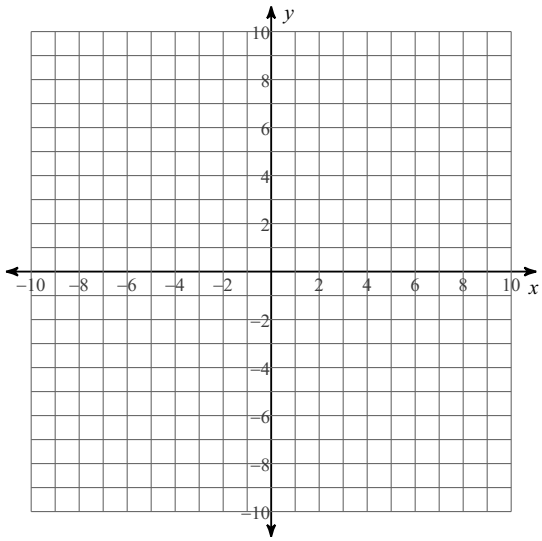
21) $y > -\frac{7}{5}x + 4$

$y < -\frac{2}{5}x - 1$

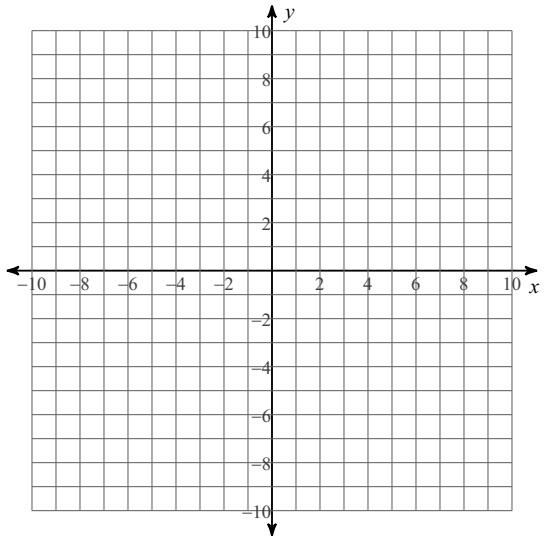


22) $y > -\frac{11}{6}x - 7$

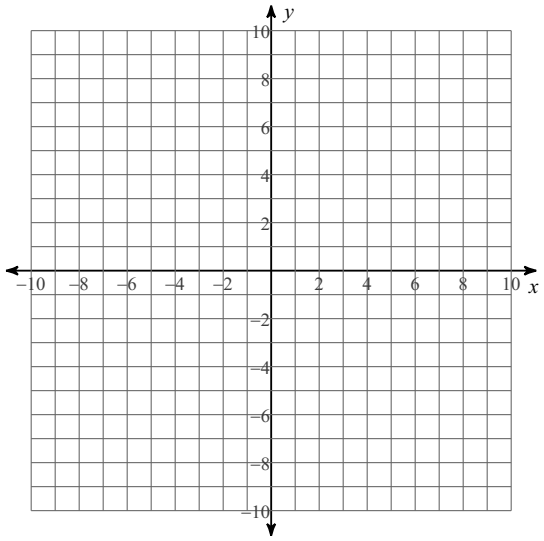
$y > \frac{1}{2}x + 7$



23) $4x - y \leq -6$
$3x + 2y \geq -10$



24) $x + 2y < 16$
$3x - 2y \geq -8$



Simplify. Write "undefined" for expressions that are undefined.

25) $\begin{bmatrix} -2 & 2 & 0 \end{bmatrix} + \begin{bmatrix} -2 & 5 & -4 \end{bmatrix}$

26) $\begin{bmatrix} -4 & 3 \\ -6 & -5 \\ 3 & 5 \end{bmatrix} - \begin{bmatrix} -6 & 6 & 2 \\ -6 & -2 & 5 \end{bmatrix}$

27) $\begin{bmatrix} 5 & 1 \\ 3 & -3 \end{bmatrix} - \begin{bmatrix} 5 & -4 \\ -2 & -1 \end{bmatrix}$

28) $\begin{bmatrix} -1 & -5 & 5 & 0 \\ 3 & -2 & -2 & 4 \end{bmatrix} - \begin{bmatrix} 2 & -1 & -5 & 1 \\ -3 & 4 & -1 & -5 \end{bmatrix}$

29) $\begin{bmatrix} -2 & 5 & -6 \\ 0 & 4 & 1 \end{bmatrix} + \begin{bmatrix} -5 & -1 & 0 \\ -3 & -6 & 1 \end{bmatrix}$

30) $\begin{bmatrix} 4 & -6 \\ 4 & 0 \\ -1 & 3 \end{bmatrix} + \begin{bmatrix} 1 & 5 \\ -4 & 0 \\ -1 & -3 \end{bmatrix}$

31) $\begin{bmatrix} -2 \\ -5 \\ -2 \end{bmatrix} - \begin{bmatrix} -2 \\ -3 \\ 1 \end{bmatrix}$

32) $3\begin{bmatrix} -2 & 5 \\ 6 & 1 \\ 4 & -3 \\ 1 & 5 \end{bmatrix}$

33) $\begin{bmatrix} -1 & -4 & -2 & -5 \\ 5 & -1 & 2 & -4 \end{bmatrix} \cdot \begin{bmatrix} -1 & 0 \\ 4 & -2 \\ 5 & -5 \\ 3 & 2 \end{bmatrix}$

34) $\begin{bmatrix} 5 & 2 & 0 & -4 \\ -4 & 4 & 4 & 5 \end{bmatrix} \cdot \begin{bmatrix} -5 & 2 \\ 2 & -4 \\ -4 & -2 \\ 3 & -5 \end{bmatrix}$

35) $\begin{bmatrix} -3 & 2 \\ 6 & 5 \end{bmatrix} \cdot \begin{bmatrix} 6 & 2 & -1 \\ 2 & 0 & -5 \end{bmatrix}$

36) $\begin{bmatrix} -5 & -2 & 4 & -6 \\ 1 & -6 & 1 & 5 \end{bmatrix} \cdot \begin{bmatrix} 0 & -1 \\ -1 & -2 \\ 3 & 2 \end{bmatrix}$

Solve each equation.

37) $\begin{bmatrix} -32 & -4 & 8 \end{bmatrix} = -4X$

38) $3A = \begin{bmatrix} -15 & 9 & 15 \\ -27 & -27 & 18 \end{bmatrix}$

39) $5Y = \begin{bmatrix} 35 \\ 30 \\ 10 \end{bmatrix}$

40) $4A = \begin{bmatrix} 4 & 4 & 4 & -32 \end{bmatrix}$

Evaluate each determinant.

41) $\begin{vmatrix} 1 & -2 \\ 6 & 6 \end{vmatrix}$

42) $\begin{vmatrix} 2 & 0 \\ 2 & 1 \end{vmatrix}$

43) $\begin{vmatrix} -5 & -5 \\ 6 & 5 \end{vmatrix}$

44) $\begin{vmatrix} -2 & 3 \\ 0 & 4 \end{vmatrix}$

Find the inverse of each matrix.

45) $\begin{bmatrix} -6 & 1 \\ -10 & 0 \end{bmatrix}$

46) $\begin{bmatrix} 1 & 7 \\ 0 & 9 \end{bmatrix}$

47) $\begin{bmatrix} 7 & 7 \\ -7 & -7 \end{bmatrix}$

48) $\begin{bmatrix} 0 & 1 \\ 6 & -7 \end{bmatrix}$

Evaluate each determinant.

49) $\begin{vmatrix} 2 & -3 & -2 \\ -3 & -5 & 5 \\ 1 & 4 & 4 \end{vmatrix}$

50) $\begin{vmatrix} 4 & 1 & -1 \\ 4 & 1 & -2 \\ 1 & -5 & 3 \end{vmatrix}$

51) $\begin{vmatrix} 2 & -1 & -4 \\ -4 & -3 & 3 \\ -2 & -4 & -2 \end{vmatrix}$

52) $\begin{vmatrix} 0 & 5 & 4 \\ 0 & -4 & 0 \\ -4 & 1 & 0 \end{vmatrix}$

Find the inverse of each matrix.

53) $\begin{bmatrix} -2 & 3 & -3 \\ 1 & 0 & -1 \\ 6 & -3 & -3 \end{bmatrix}$

54) $\begin{bmatrix} 1 & -1 & 0 \\ 2 & 3 & 1 \\ -5 & 5 & 0 \end{bmatrix}$

55) $\begin{bmatrix} 0 & -5 & -3 \\ -5 & -3 & 5 \\ -5 & -5 & 4 \end{bmatrix}$

56) $\begin{bmatrix} 3 & 5 & 3 \\ 2 & 3 & 2 \\ 0 & 1 & -2 \end{bmatrix}$

Solve each equation or state if there is no unique solution.

57) $\begin{bmatrix} 2 & -1 & 5 \\ 6 & -8 & -5 \\ -5 & 6 & 2 \end{bmatrix} C = \begin{bmatrix} 35 & -5 & 27 \\ 20 & 15 & 21 \\ -26 & -10 & -23 \end{bmatrix}$

58) $\begin{bmatrix} 5 & 8 & -8 \\ 1 & 1 & 4 \\ -4 & -6 & 4 \end{bmatrix} Y = \begin{bmatrix} -24 \\ 9 \\ 14 \end{bmatrix}$

59) $\begin{bmatrix} 36 & 2 \\ 31 & 6 \end{bmatrix} = \begin{bmatrix} 7 & 5 \\ 7 & 6 \end{bmatrix} X - \begin{bmatrix} 0 & 4 \\ 8 & 4 \end{bmatrix}$

60) $\begin{bmatrix} -2 & 1 & 7 \\ 4 & 3 & 4 \\ -1 & -2 & -5 \end{bmatrix} C - \begin{bmatrix} -8 & -1 & -1 \\ 4 & -8 & 2 \\ -8 & -5 & -3 \end{bmatrix} = \begin{bmatrix} 23 & -1 & 0 \\ -13 & 29 & 11 \\ 6 & -5 & -2 \end{bmatrix}$

61) Identify a34.

$\begin{bmatrix} 1 & 4 & -1 & -6 \\ -5 & 6 & -5 & 1 \\ -5 & 2 & 3 & 3 \end{bmatrix}$

62) How do you know when a matrix does NOT have an inverse?

63) In order to add or subtract matrices, what has to be true?

64) What has to be true in order to mulitply matrices?

65) How do you know what the dimensions of your matrix should be when you multiply 2 matrices?

66) How do you state the dimensions of a matrix?

Solve each equation.

67) $\begin{bmatrix} 8 & 5 & -1 \\ -2 & 0 & 5 \end{bmatrix} + \begin{bmatrix} 9 & 8 \\ 0 & 1 \end{bmatrix} X = \begin{bmatrix} -19 & -7 & 48 \\ -11 & 3 & 1 \end{bmatrix}$

68) $\begin{bmatrix} 5 & 5 \\ 2 & 4 \end{bmatrix} Y - \begin{bmatrix} -6 & -5 & 4 \\ -5 & -4 & -6 \end{bmatrix} = \begin{bmatrix} -9 & 0 & 46 \\ -9 & -8 & 32 \end{bmatrix}$

69) $\begin{bmatrix} 5 \\ 4 \end{bmatrix} + \begin{bmatrix} 2 & -4 \\ 6 & -7 \end{bmatrix} C = \begin{bmatrix} 23 \\ 48 \end{bmatrix}$