Brien McMahon High School

SUMMER REVIEW
HONORS ALGEBRA 2

This packet is designed for you to review your Algebra 1 skills and make sure you are well prepared for the start of Algebra 2. It is expected that students in Algebra 2 have already mastered the concepts in this packet. Many of these topics will NOT be reviewed during the school year.

This packet is expected to be completed upon your arrival back to school, will be counted as a grade and assessed.

There are notes and worked out examples available online at the Brien McMahon website.

****It is strongly recommended to have a TI-83 or TI-84 graphing calculator for Algebra 2****

Name_____Period_____

PROBLEM SETS TO BE COMPLETED AND TURNED IN

I. MENTAL MATH

Simplify the following problems using mental math (NO CALCULATOR).

1) $672+142$ **2)** $48+13+12$ **3)** $350+227$ **4)** $87+14$ **5)** $455+82$

6) $40\cdot 7$ **7)** $562\cdot 5$ **8)** $341\cdot 9$ **9)** $37\cdot 4$ **10)** $753\cdot 3$

II. PRIME FACTORIZATION

1) 300 **2)** 76 **3)** 450 **4)** 60 **5)** 48

6) 363 **7)** 448 **8)** 1000 **9)** 98 **10)** 891

III. REAL NUMBERS AND THEIR PROPERTIES

a. Complete the chart by placing a check in all the boxes that apply to the number in the table.

		NATURAL NUMBERS	WHOLE NUMBERS	INTEGERS	RATIONAL NUMBERS	IRRATIONAL NUMBERS	REAL NUMBERS
1)	-4						
2)	8						
3)	$\sqrt{3}$						

4)	$\frac{2}{5}$						
5)	$\frac{1}{3}$						

b. Identify the property being performed.

6) $5 \cdot 4 = 4 \cdot 5$

7) $3(2 \cdot 4) = 4(2 \cdot 3)$

8) $-4(1) = -4$

9) $10 + -10 = 0$

10) $4(6-9) = 4 \bullet 6 + 4 \bullet -9$

11) $\frac{1}{5} \bullet 5 = 1$

12) $0 \cdot 36 = 0$

13) $(9-7)(5) = 2(5)$

14) $(-7+4)+1 = -7+(4+1)$

15) $5(12-4) = 5(12) - 5(4)$

16) $(-0.5) \bullet (-2) = 0$

17) $\left(-0.\overline{333}\right)\left(0.\overline{333}\right) = 0$

18) $36jkm = 36mjk$

19) $-29c + 29c = 0$

IV. ORDER OF OPERATIONS

a. Simplify each expression using the order of operations. Show all work.

1) $(6+9) \bullet 3^2$

2) $4(2+3)^2$

3) $\frac{3(4+11)}{10-3 \cdot 3}$

4) $47-3[6+8\div 2]$ **5)** $4(x+2)+3x$ **6)** $3(2x+5)-(5-3x)$

7) $\dfrac{3\cdot 2-3\cdot 1+14\div 2}{6\div 3+6\div 2}$ **8)** $2(x-1)-5(x-3)$ **9)** $2(5-2)^2+2(4-2)^2$

b. Evaluate each expression if a = 2, b = 3, c = -2, d = 4, f = -5. Show all work.

10) cf **11)** $d-c$ **12)** $-ca^2$

13) $(b+cd)(ac)$ **14)** $(cf)-(ab)$ **15)** dc^a

16) a^2b^2 **17)** $5c+3bc$ **18)** $a-b-c-d$

c. Simplify each of the following. (Remember to use order of operations). Show all work.

19) $3x-4+7x-8-10x-2$

20) $4x+2(x+5)$

21) $3(x+5)-4(x-6)$

22) $5x^3+2x^2-7x-x^3+5x^2-18$

23) $(5x^2+x-4)-(9x^2-4x-11)$

24) $12x^3(x^4-5x^2+2)+4x^7$

25) $(x+2)(x^2-5x+1)$

26) $5xy-20x+6y-(10xy+10x)$

27) $2x\left(3x^2-4x+2\right)-5x\left(2x+3\right)$

28) $5x^2y^2+3xy-3x^2y^2+2x^3y^2+5xy$

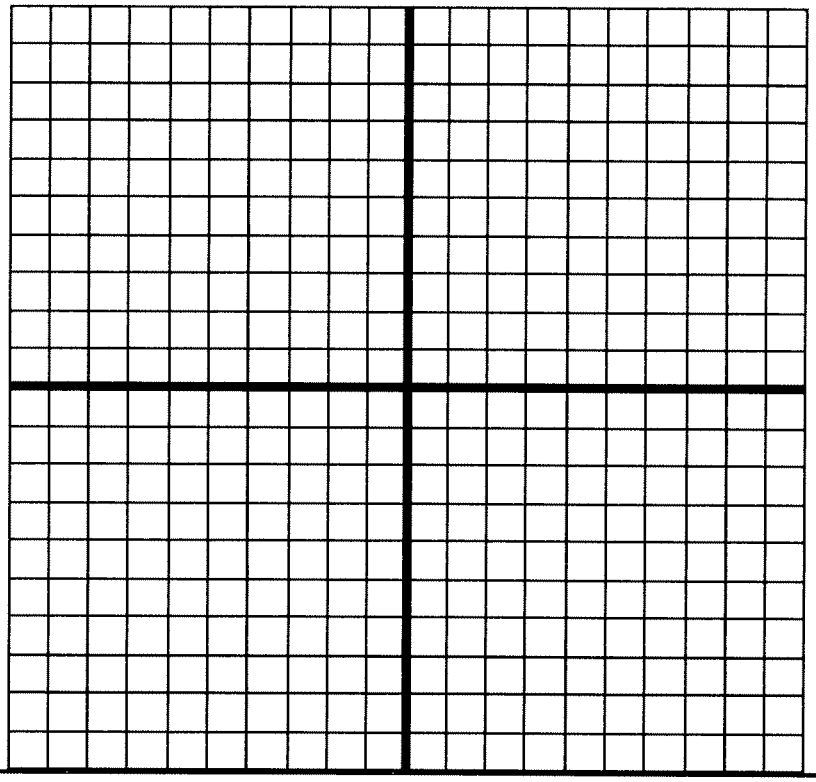
V. PLOTTING POINTS ON THE COORDINATE PLANE

a. Plot the following points on the grid below and label them.

1) $A(4,-5)$ **2)** $B(0,-4)$ **3)** $C(-3,-1)$ **4)** $D(-2,-2)$ **5)** $E(3,0)$

6) $F(5,1)$ **7)** $G(-3,7)$ **8)** $H(10,-2)$ **9)** $I(-1,-4)$ **10)** $J(0,2)$

11) $K(-3,10)$ **12)** $L(4,0)$ **13)** $M(-2,1)$ **14)** $N(3,4)$ **15)** $P(0,0)$



VI. SOLVING EQUATIONS

Solve the following equations and check your solutions.

1) $-3x+4=11$

2) $\frac{1}{2}x-8=3$

3) $8x-24=-6+18$

4) $-6+x-4=7x+2$

5) $\frac{2}{3}x+6=18$

6) $6-x-5=-4x-3-x$

7) $12+\frac{b}{4}=58-b$

8) $4(m-2)=7-m$

9) $4t+7+6t=-33$

10) $6=-z-4$

11) $4m+2.3=9.7$

12) $2a+5=9a-16$

13) $\frac{1}{3}+\frac{4}{6}y=\frac{2}{3}$

14) $6(y-2)=8-2y$

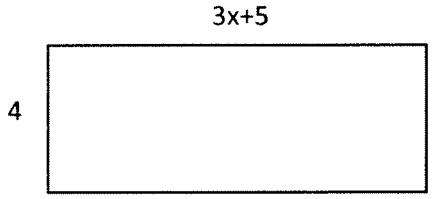
15) $n+3(n-2)=10$

16) $\frac{m}{12} = 2.7$ **17)** $-4.7 = 3x + 1.3$ **18)** $-3(x+4) = -27$

VII. WORD PROBLEMS

Solve the word problem by setting up an equation. Show your work.

1) Find x and the dimensions of the rectangle given that the area is 164 ft^2.



2) The sum of three consecutive integers is 156. Find the integers.

3) Frank weighs 145 pounds. He wants to join the wrestling team and would like to increase his weight to 210 pounds. He goes to the doctor, who gives him a special weight-gaining protein shake. The doctor predicts Frank can gain about 2.5 pounds a week. How long will it take him to reach his goal?

4) A taxi cab charges each person a flat fee of $1.85 plus an additional $0.40 per quarter mile. How far did Paulette travel if her fare was $14.65?

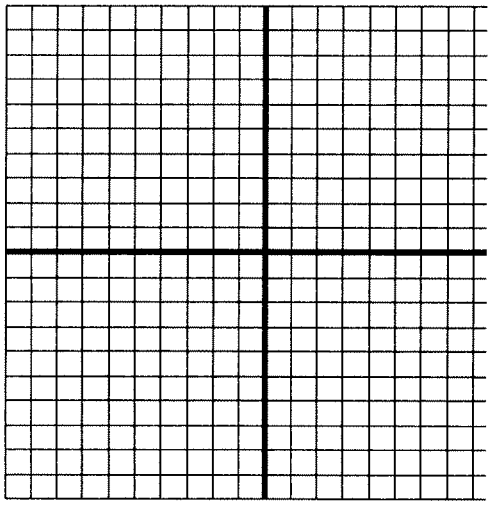
5) Alex gets a new job as a salesman. He earns a monthly base salary of $5000 plus a commission of 5.25% on all sales. What must Alex's total sales be in order for him to make $8,000 for the month?

6) A stock currently costs $44. It is down 20% so far this year. How much did the stock cost at the beginning of the year?

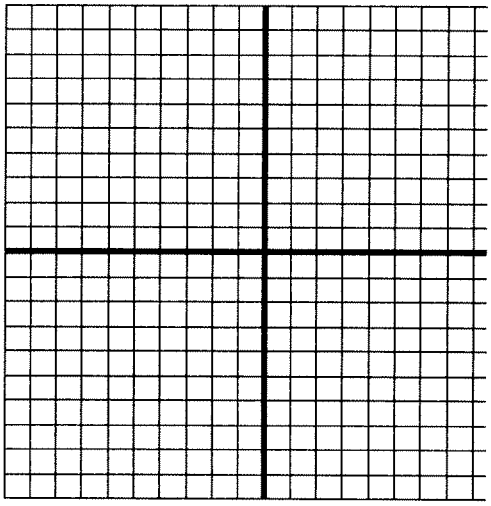
VIII. GRAHING LINEAR EQUATIONS

Sketch each of the lines on the graph below.

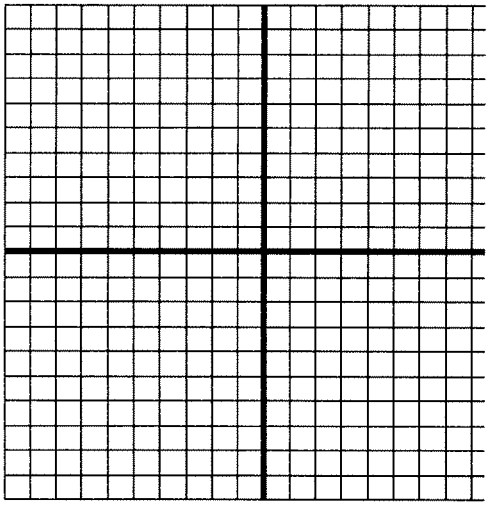
1) $y = 2x$



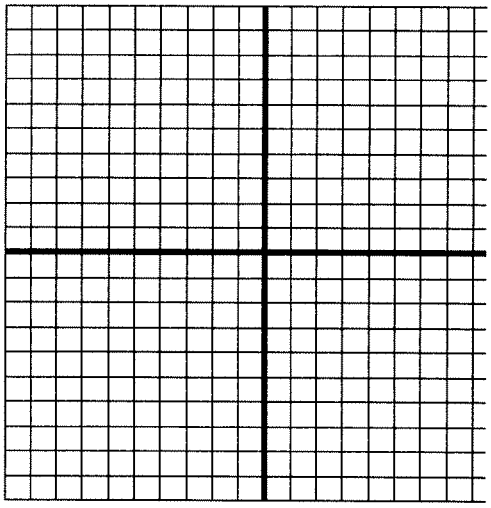
2) $y = -3x$



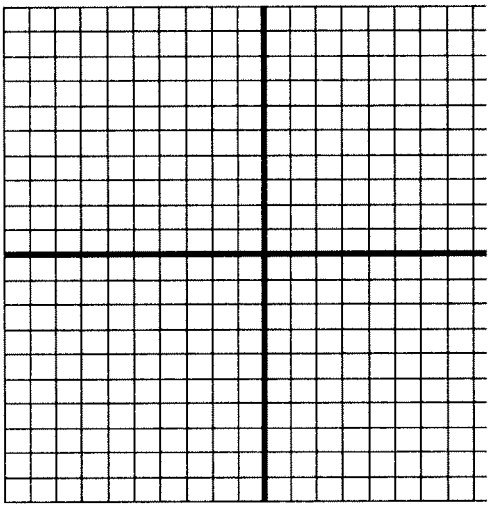
3) $y = \frac{3}{4}x$



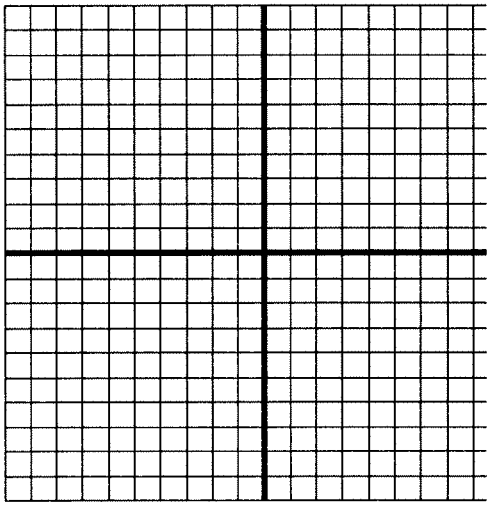
4) $y = -\frac{4}{3}x$



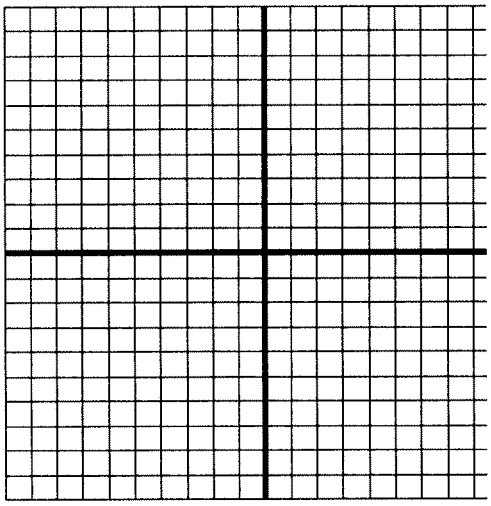
5) $y = 6$



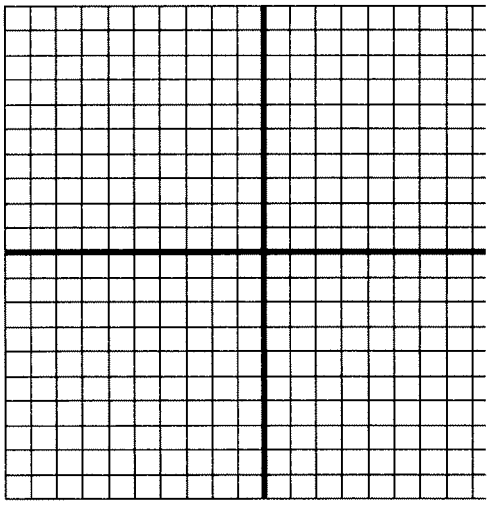
6) $x = -4$



7) $y = \frac{4}{5}x - 6$

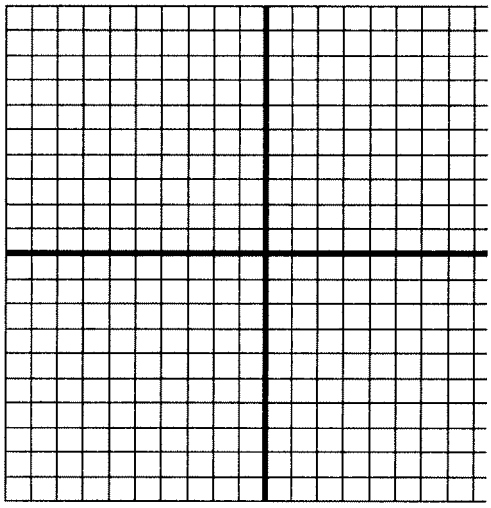


8) $y = -\frac{5}{3}x + 8$

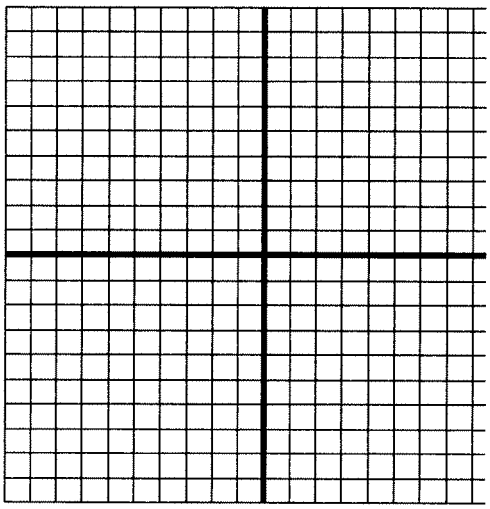


9) $y = 3x - 2$

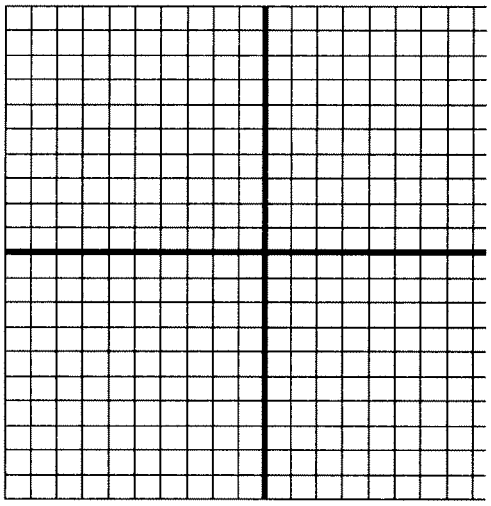
10) $y = -4x + 6$



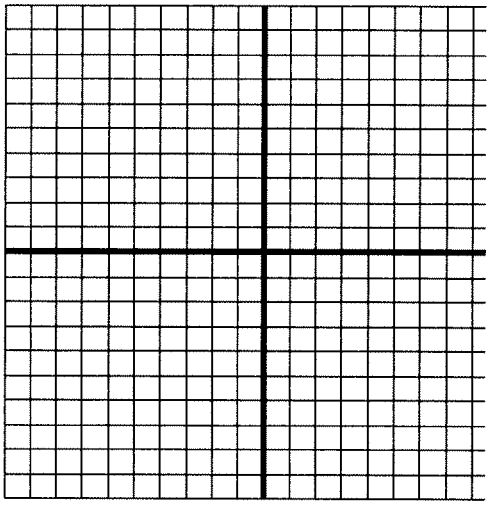
11) $x = 2$



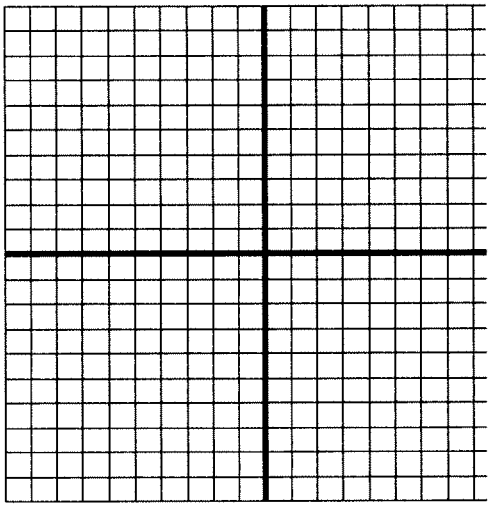
12) $y = -5$



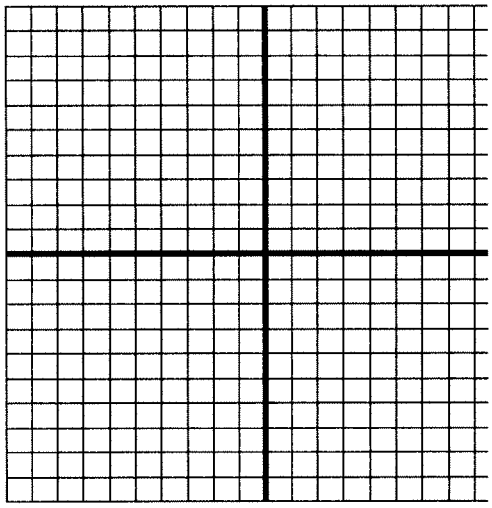
19) $2x + 3y = 12$



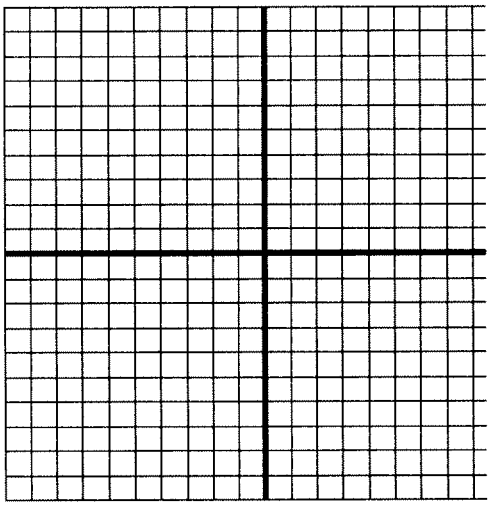
20) $-2x + 7y = 14$



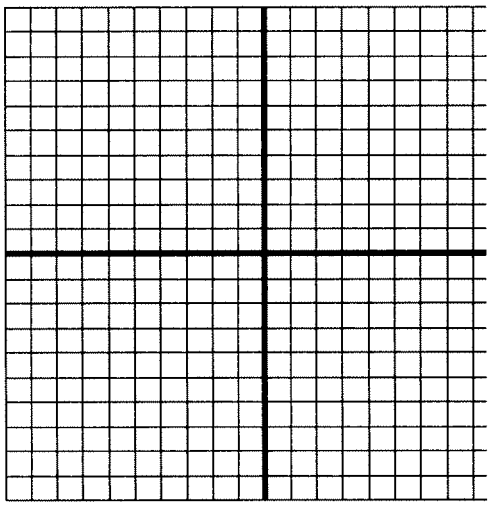
21) $x-5y=15$



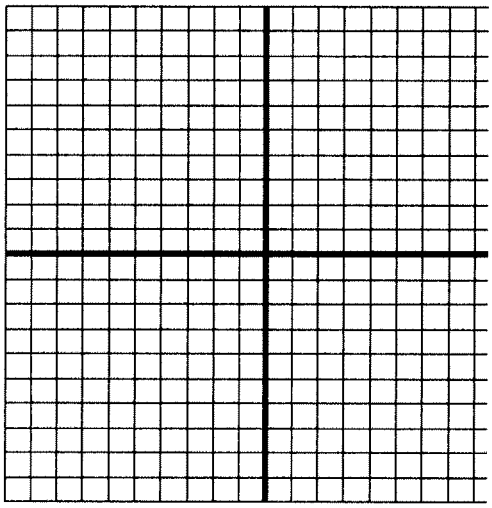
22) $-4x+2y=-10$

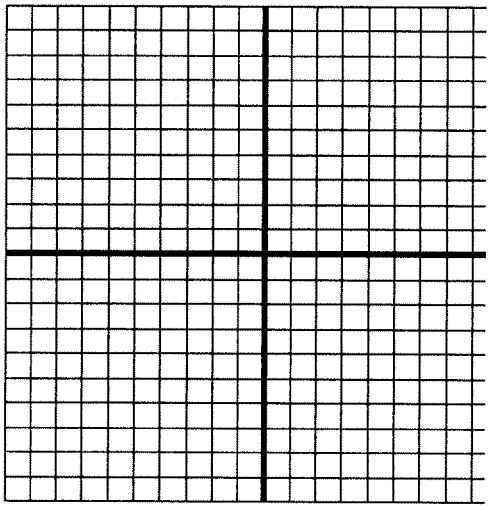


23) $x-y=7$



24) $3x+8y=-24$

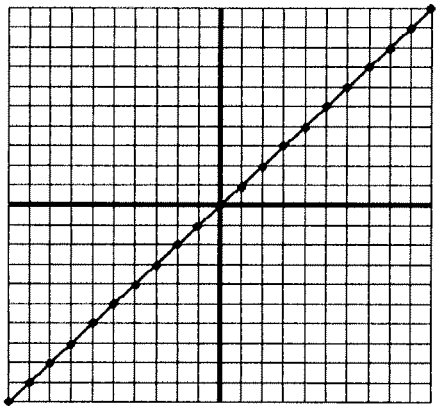




IX. DETERMINING LINEAR EQUATIONS FROM GRAPHS

Find the slope and y-intercept and x-intercept of each line. Then write the equation of each line in slope-intercept form.

1)



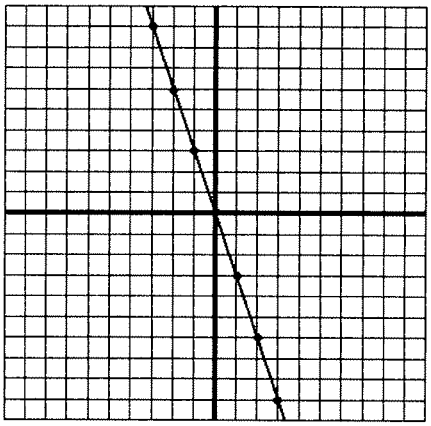
y –intercept:_____

x – intercept: _____

slope: _____

equation: _____

2)



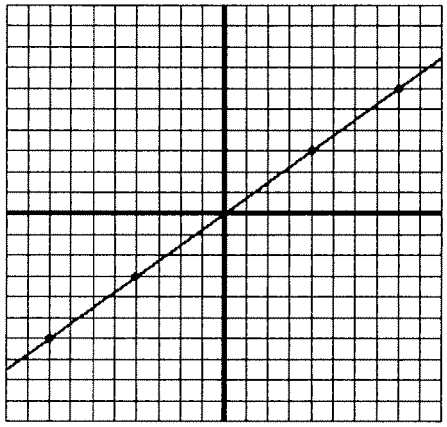
y –intercept:_____

x – intercept: _____

slope: _____

equation: _____

3)



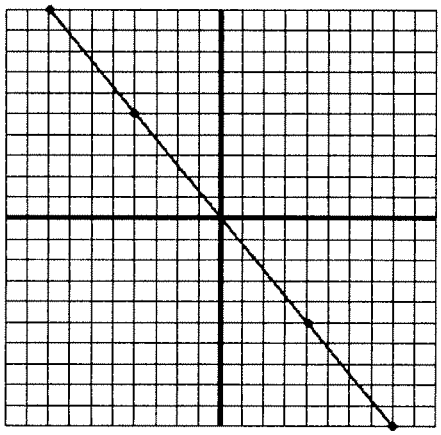
y –intercept:_____

x – intercept: _____

slope: _____

equation: _____

4)



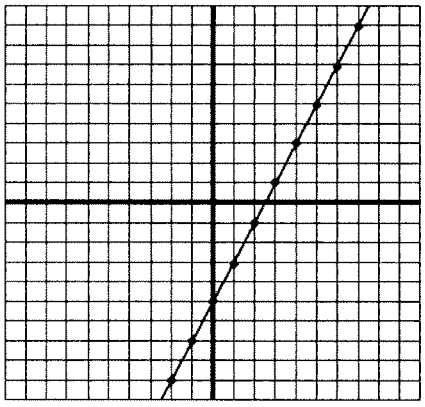
y –intercept:_____

x – intercept: _____

slope: _____

equation: _____

5)



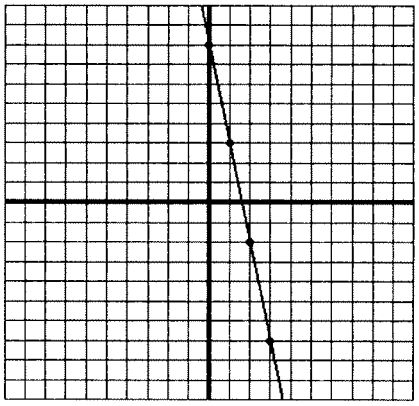
y –intercept:_____

x – intercept: _____

slope: _____

equation: _____

6)



y –intercept:_____

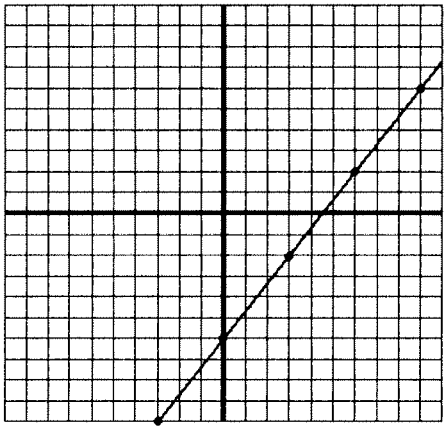
x – intercept: _____

slope: _____

equation: _____

7)

8)

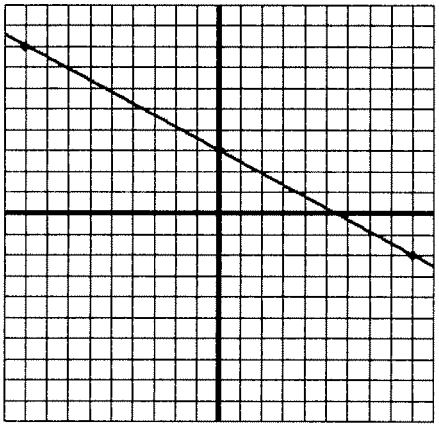


y –intercept:_____

x – intercept: _____

slope: _____

equation: _____



y –intercept:_____

x – intercept: _____

slope: _____

equation: _____

X. WORKING WITHOUT GRAPHS

a. Find the equation of each line. Leave your answer in slope-intercept form.

1) A line that passes through the point (-5, 6) with a slope of 4.

2) A lines that passes through points (4, 1) and (7, -11).

3) A line that is perpendicular to $y=6-3x$ and passes through the x-axis at -4.

4) A line that passes through points (4, 7) and (4, -3).

b. Find the x- and y-intercepts and the slope of the line.

1) $y=4x-2$

y –intercept:_____

x – intercept: _____

slope: _____

2) $6x-3y=15$

y –intercept:_____

x – intercept: _____

slope: _____

3) $y=2x-5$

y –intercept:_____

x – intercept: _____

slope: _____

4) $4x+3y=12$

y –intercept:_____

x – intercept: _____

slope: _____

5) $3y=4x-9$

y –intercept:_____

x – intercept: _____

slope: _____

6) $5x-y=15$

y –intercept:_____

x – intercept: _____

slope: _____

XI. COMPLETING TABLES

Complete the table.

	x	$2x+3$
1)	-4	
2)	- 2	
3)	0	
4)		- 15
5)		25

	x	x^2+4
6)	0	
7)	- 5	
8)	13	
9)	- 7	
10)	32	

XII. TWO VARIABLE WORD PROBLEMS

Answer the word problems by showing all work.

Problem Situation: A hot air balloon is currently at an altitude of 10,000 feet. The operator of the air balloon begins to descend the balloon at a rate of 50 feet per minute.

1) Write an equation for the altitude (a) of the balloon as a function of the time (t).

2) Find the altitude of the balloon after:

a. 10 minutes?

b. 30 minutes?

c. 1 hour?

3) How long will it take for the balloon to be at:

a. 7500 feet?

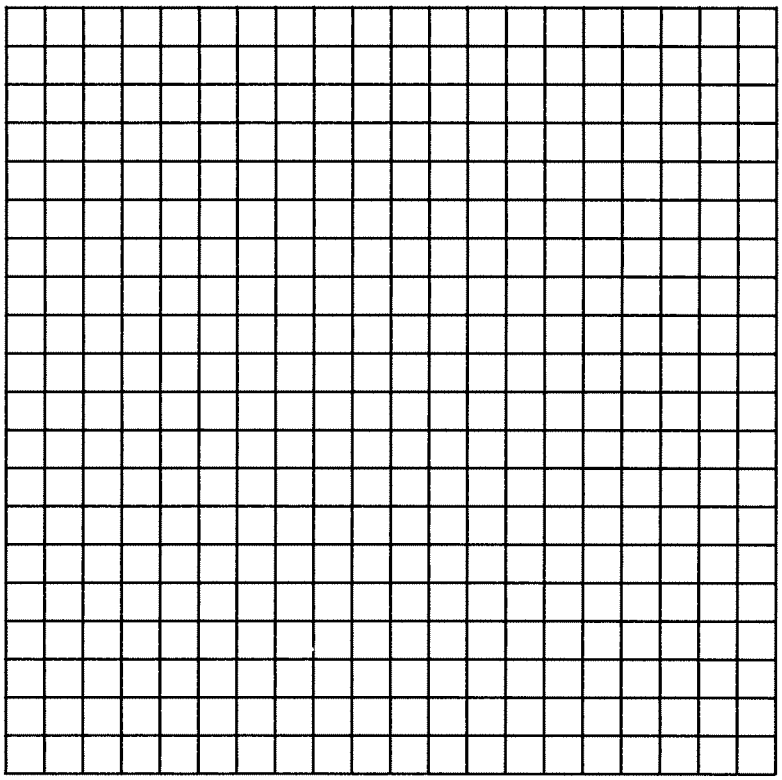
b. 2000 feet?

c. On the ground?

4) Complete the table using your answers from above and graph the altitude of the balloon as a function of the time in minutes that the balloon takes to descend to the ground.

Time (min)	Altitude (feet)
10	
30	
60	
	7500
	2000
	0

Altitude (ft)



Time (min)

Problem Situation: This summer you and a friend recorded your first CD. In order to produce your CD you need to hire a recording studio. One studio you called charges $250 for making a master CD and $3 to burn each CD after that.

1) Write an equation that models the cost of burning the CD's.

2) How much will it cost to burn:

a. 75 CD's?

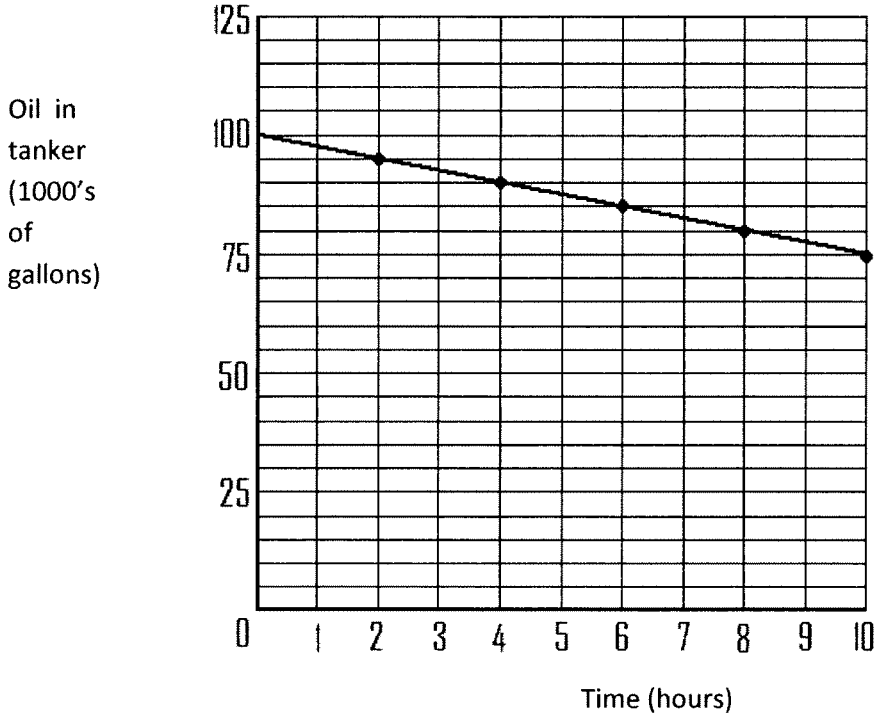
b. 250 CD's?

3) How many CD's can be made for:

a. $3,000?

b. 1750?

Problem Situation: A tanker that is filled with oil pulls into an oil refinery. The tanker is going to offload the oil, as shown in the graph below.



1) How many gallons of oil are in the tanker when it pulls into the refinery?

2) At what rate, in gallons per hour, is the tanker unloading the oil?

3) Write an equation for the amount of oil (g) after h number of hours.

4) How much oil is left in the tanker after:

a. 15 hours?

b. 25 hours?

5) How long will it take for the tanker to have:

a. 60,000 gallons left?

b. 25,000 gallons left?

c. To be empty?

XIII. EXPONENTS AND THEIR PROPERTIES

Simplify.

1) $\left(c^5\right)(c)\left(c^2\right)$

2) $\frac{m^{15}}{m^3}$

3) $\left(k^4\right)^5$

4) $(12x^2y)^0$

5) $\left(p^5q^2\right)\left(p^7q^5\right)$

6) $\frac{45y^3z^{10}}{5y^3z}$

7) $\left(-t^7\right)^3$

8) $3f^3g^0$

9) $\left(4h^5k^3\right)\left(15k^2h^3\right)$

10) $\frac{12a^4b^6}{36ab^2c}$

11) $\left(3m^2n\right)^4$

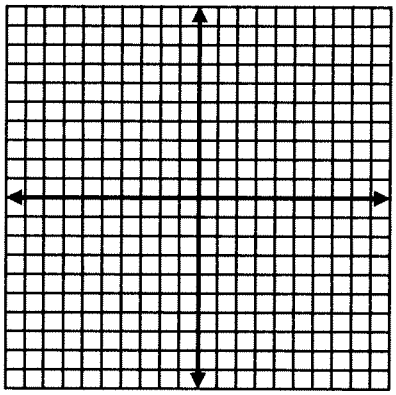
12) $\frac{(4a^5b^3)^2}{24a^3b^5c^2}$

13) $(-5a^2b)(2ab^2c)(-3b)$ **14)** $4x(2x^2y)^0$ **15)** $(3x^4y)(2y^2)^3$

XIV. SYSTEMS OF EQUATIONS

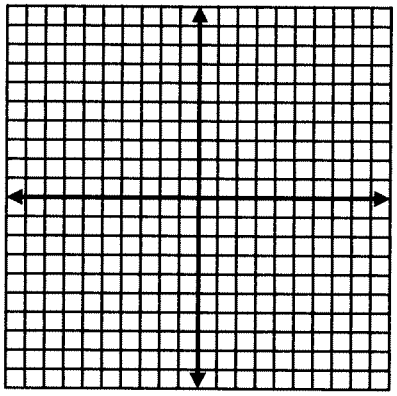
a. Solve the system by graphing.

1) $\begin{cases} y=-3x-2 \\ y=2x+8 \end{cases}$



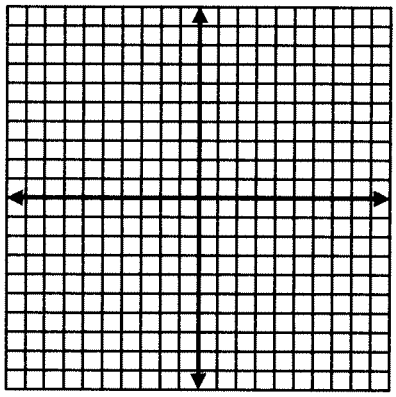
Solution: _____

2) $\begin{cases} y=-2x+5 \\ y=2x-13 \end{cases}$



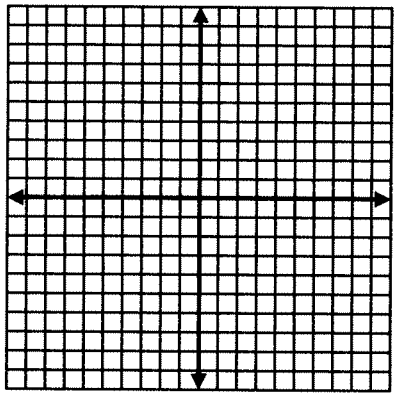
Solution: _____

3) $\begin{cases} y=-x \\ y-x=5 \end{cases}$



Solution: _____

4) $\begin{cases} y=3x+2 \\ y-3x=-4 \end{cases}$



Solution: _____

b. Solve the word problem by using a system of equations.

Problem Situation: Wireless company A has a plan that charges $20 initial fee and $0.05 for every call. Wireless company B has a plan that has NO initial fee but charges $0.25.

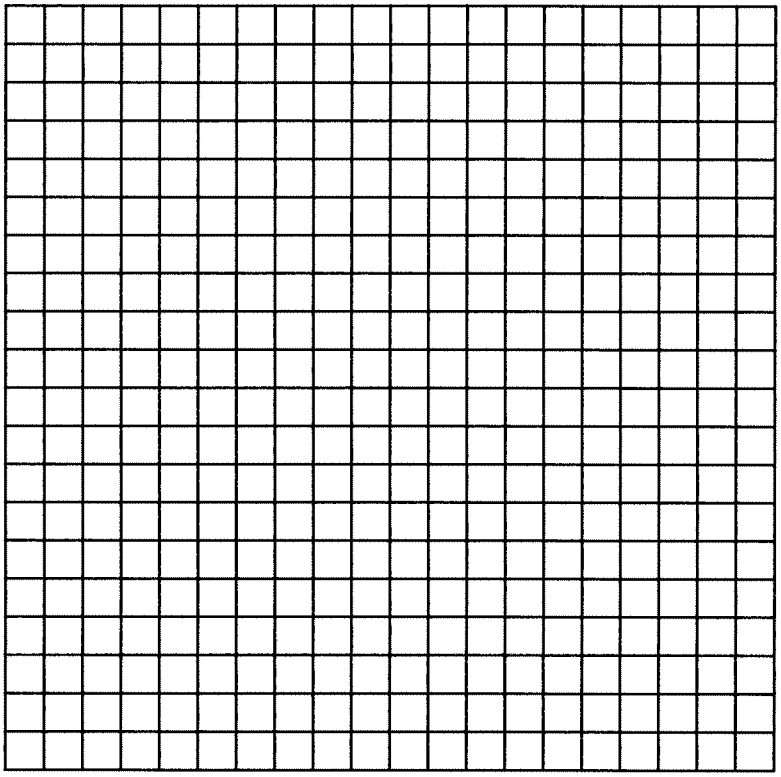
5) Write an equation for each company.

Company A: _____ Company B: _____

6) Complete the table below.

Number of Calls	Company A	Company B
# of Calls	Dollars	Dollars
50		
80		
100		
120		
150		

7) Use the table to create a graph.



8) Describe when you would subscribe to each company

c. Solve the system using substitution.

9) $\begin{cases} y = 4x + 3 \\ y = 2x - 8 \end{cases}$

Solution: _____

10) $\begin{cases} y = 9x - 5 \\ y = -6x + 25 \end{cases}$

Solution: _____

11) $\begin{cases} 2x - 3y = -2 \\ 4x + y = 24 \end{cases}$

Solution: _____

12) $\begin{cases} x = -3 - 2y \\ 3x - 3y = 3 \end{cases}$

Solution: _____

d. Solve the system using substitution.

13) $\begin{cases} y + x = 7 \\ 2x + 3y = 14 \end{cases}$

Solution: _____

14) $\begin{cases} y = 3x - 5 \\ -4x + y = -11 \end{cases}$

Solution: _____

15) $\begin{cases} x = y + 5 \\ 2x - 4y = 2 \end{cases}$

Solution: _____

16) $\begin{cases} y = -7x \\ 4x - 5y = -39 \end{cases}$

Solution: _____

e. Solve the system using elimination.

17) $\begin{cases} x + 2y = 6 \\ 2x - 2y = 12 \end{cases}$

Solution: _____

18) $\begin{cases} x - y = 6 \\ -x + y = 18 \end{cases}$

Solution: _____

19) $\begin{cases} -5x + y = 1 \\ 9x - 2y = 4 \end{cases}$

Solution: _____

20) $\begin{cases} 3x - 2y = 17 \\ -2x - 5y = 14 \end{cases}$

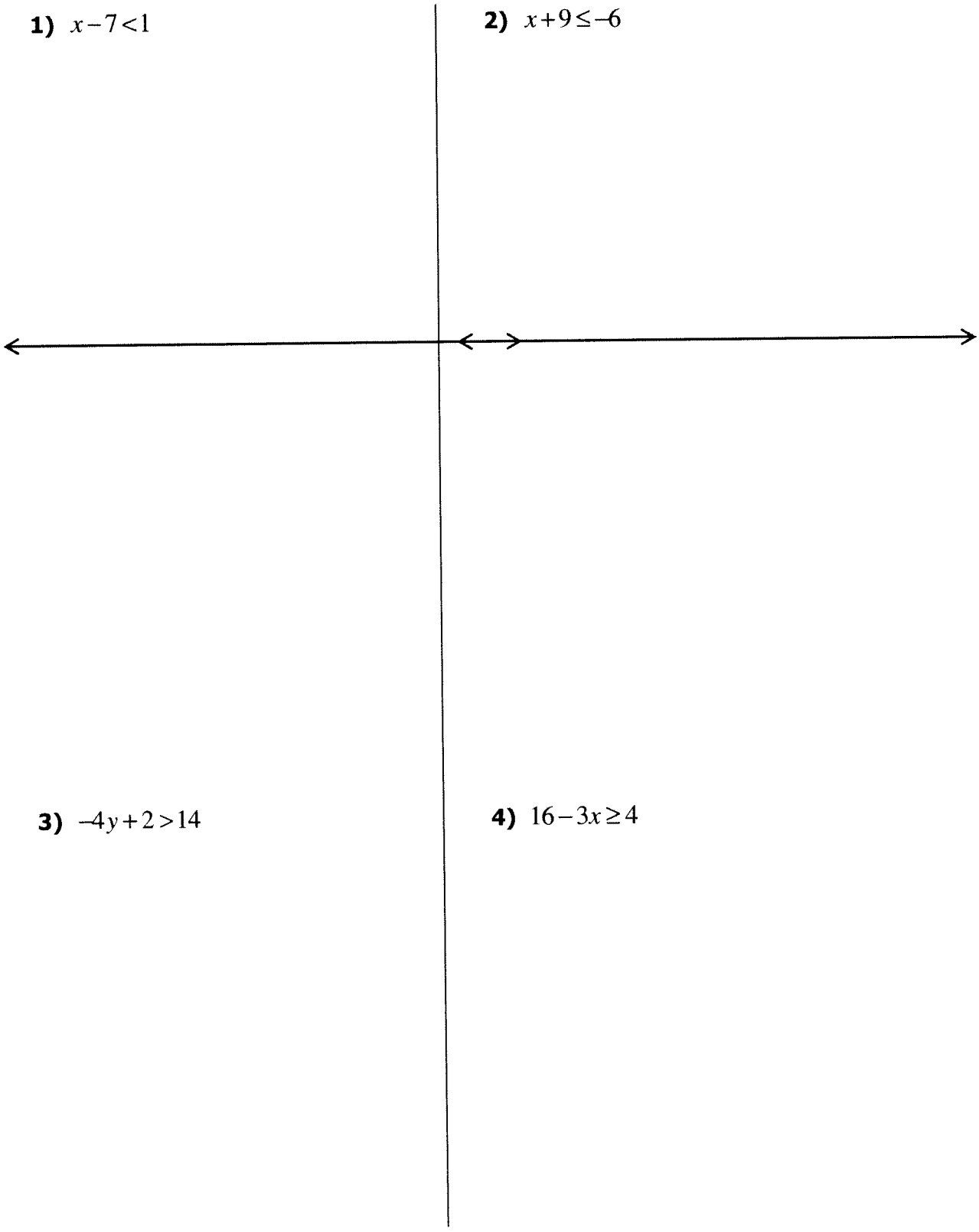
Solution: _____

XV. SOLVING LINEAR INEQUALITIES

Solve the inequality and graph its solution.

1) $x-7<1$

2) $x+9\leq -6$



3) $-4y+2>14$

4) $16-3x\geq 4$