Translate each situation into an algebraic equation:

1) Ann has the 5 newest music CD's which is 3 less than twice the amount that Bob has. _____

2) Mike, who has 6 video games, has half as many games as Paul.

   _____

3) Nan rode the roller coaster 8 times, which was twice as many times as she rode the Ferris wheel. _____

4) Janine, who bought $15 worth of make-up, spent $6 less than Leah spent. _____

5) Rob, who has all 13 girls' phone numbers that are in his homeroom, has 3 more than half the number of girls' phone numbers that Jay has.

   _____

6) Kate's 85 on her English test was 37 points less than twice the grade on her Science test. _____

7) At the Middle School Graduation Dance, the DJ played 12 slow dances, which was equal to the quotient of the number of fast dances and 2. _____

8) The 1,840 rock concert tickets sold were twice the amount of jazz concert tickets sold. _____

9) Meg received 90 votes for Student Council President, which were 50 less than twice the amount that Tom received.

   _____

10) The 347 students who listed soccer as their favorite sport were 13 less than three times the number of students who listed basketball as their favorite sport. _____

1. Suppose that the water level of a river is 34 feet and that it is receding at a rate of 0.5 foot per day. Write an equation for the water level, L, after d days. In how many days will the water level be 26 feet?

2. Seth's father is thinking of buying his son a six-month movie pass for $40. With the pass, matinees cost $1.00. If matinees are normally $3.50 each, how many times must Seth attend in order for it to benefit his father to buy the pass?

3. For babysitting, Nicole charges a flat fee of $3, plus $5 per hour. Write an equation for the cost, C, after h hours of babysitting. What do you think the slope and the y-intercept represent? How much money will she make if she baby-sits 5 hours?

6. A plumber charges $25 for a service call plus $50 per hour of service. Write an equation in slope-intercept form for the cost, C, after h hours of service. What will be the total cost for 8 hours of work? 10 hours of work?

7. Rufus collected 100 pounds of aluminum cans to recycle. He plans to collect an additional 25 pounds each week. Write and graph the equation for the total pounds, P, of aluminum cans after w weeks. What does the slope and y-intercept represent? How long will it take Rufus to collect 400 pounds of cans?

8. A canoe rental service charges a $20 transportation fee and $30 dollars an hour to rent a canoe. Write and graph an equation representing the cost, y, of renting a canoe for x hours. What is the cost of renting the canoe for 6 hours?

9. A caterer charges $120 to cater a party for 15 people and $200 for 25 people. Assume that the cost, y, is a linear function of the number of x people. Write an equation in slope-intercept form for this function. What does the slope represent? How much would a party for 40 people cost?

10. An attorney charges a fixed fee on $250 for an initial meeting and $150 per hour for all hours worked after that. Write an equation in slope-intercept form. Find the charge for 26 hours of work.

11. A water tank already contains 55 gallons of water when Baxter begins to fill it. Water flows into the tank at a rate of 8 gallons per minute. Write a linear equation to model this situation. Find the volume of water in the tank 25 minutes after Baxter begins filling the tank.

12. A video rental store charges a $20 membership fee and $2.50 for each video rented. Write and graph a linear equation (y=mx+b) to model this situation. If 15 videos are rented, what is the revenue? If a new member paid the store $67.50 in the last 3 months, how many videos were rented?

Literal Equations – Worksheet

SHOW ALL WORK!!

Regular Equations

Literal Equations

1a) $43 - 2x = 11$

1b) Solve for x: $3y + 2x = -1$

2a) $23 + 4x - 34 = -11$

2b) Solve for k: $3 - 3k + 7k = 5b$

3a) $3(2x - 7) = 6$

3b) Solve for b: $\frac{1}{2}(4a + 10b) = c$

Formulas can be manipulated through the process of solving literal equations.

4) Solve for h: $A = bh$ (area of a parallelogram)

5) Solve for b: $A = \frac{1}{2}bh$ (Area of a triangle)

6) Solve for r: $C = 2\pi r$ (Circumference of a circle)

7) Solve for w: $P = 2L + 2W$ (Perimeter of a rectangle)

8) Solve for t: $D = rt$ (Linear motion)

9) Solve for C: $F = \frac{9}{5}C + 32$ (Temperature conversions)

Sketch the graph of each line.

1) $y = \dfrac{7}{2}x - 2$
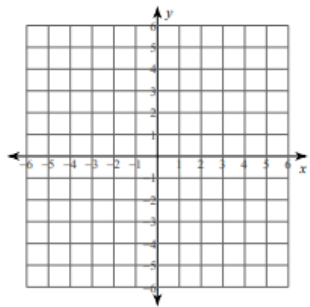
2) $y = -6x + 3$
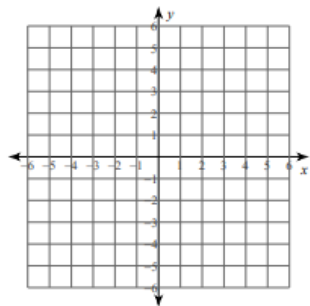
3) $y = -5$
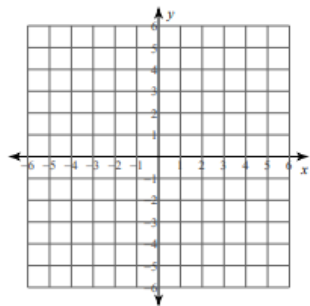
4) $y = \dfrac{6}{5}x + 1$
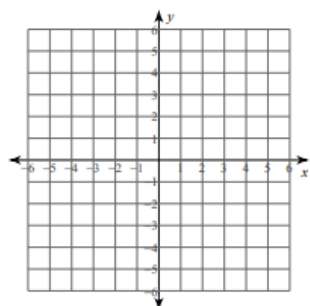
5) $y = \dfrac{1}{4}x + 2$
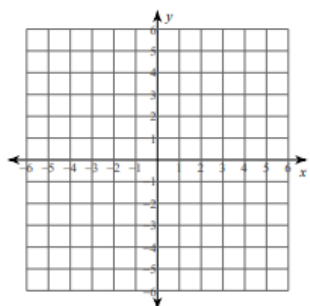
6) $x = 5$
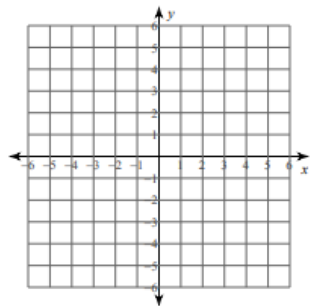
7) $x + y = 0$
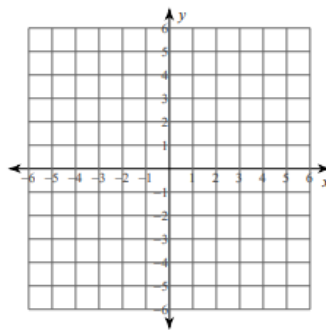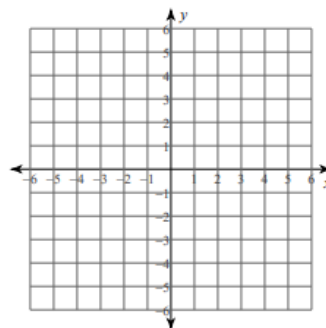
8) $9x + y = 4$

9) $x - 2y = -6$

10) $x + 4y = -12$

11) $x - 3y = 3$
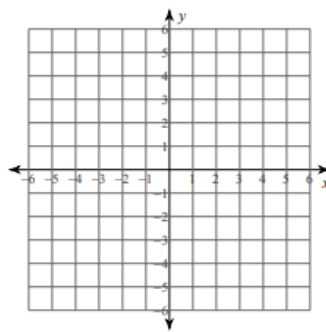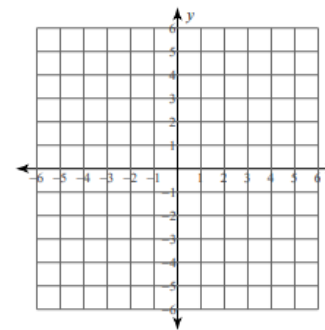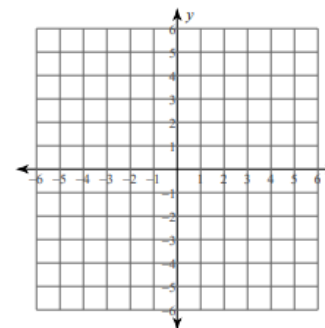
12) $x + y = 4$
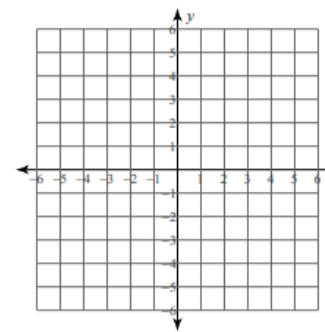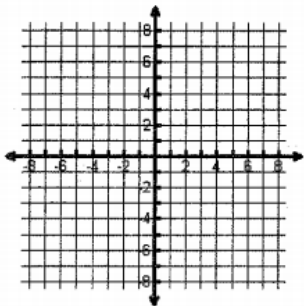
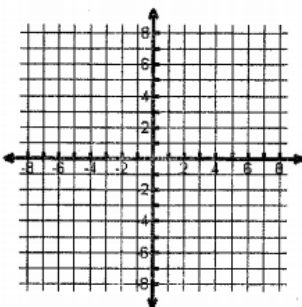**Graph the system to find your solution.**

1. $y = 3x - 4$
   $y = -3x + 2$
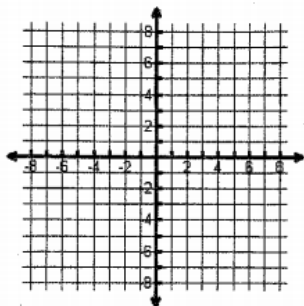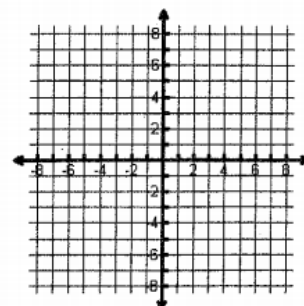
2. $y = \frac{4}{3}x + 3$
   $y = -\frac{2}{3}x - 3$
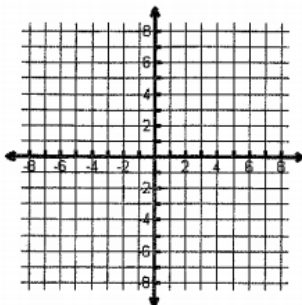
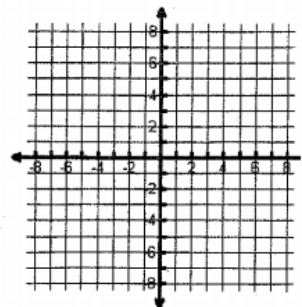3. $y = \frac{5}{4}x - 2$
   $y = \frac{5}{4}x - 1$

4. $y = \frac{1}{3}x + 2$
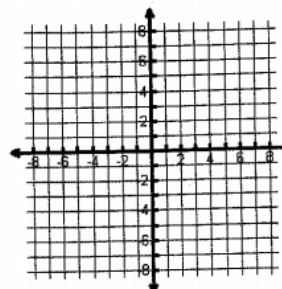 $y = -x - 2$
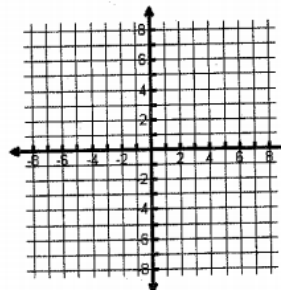
5. $y = -\frac{3}{2}x - 4$
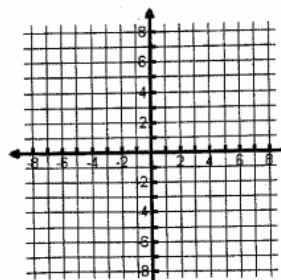 $y = \frac{1}{2}x + 4$

6. $y = 4x - 1$
   $y = -x + 4$

7. $y = \frac{3}{4}x + 1$
   $y = -\frac{1}{2}x - 4$

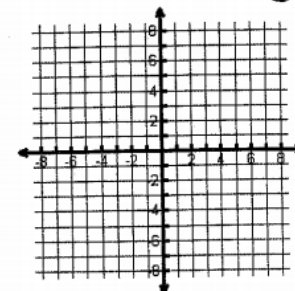8. $2y + 3x = -6$
   $2y + x = 2$

9. $-x + y = -4$
   $x + y = 2$

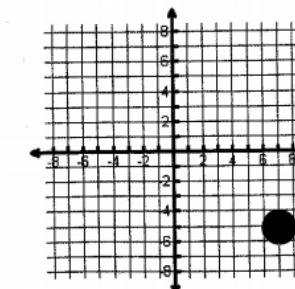10. $y - 3x = 4$
    $x + y = 4$

11. $y = -x + 1$
    $x = -3$
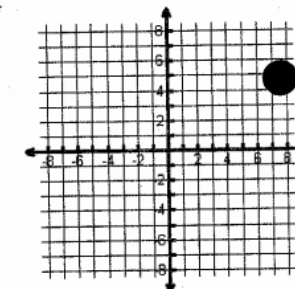
12. $y = -4$
    $x = 2$

Solve each system by elimination.

1) $-4x - 2y = -12$
$4x + 8y = -24$

2) $4x + 8y = 20$
$-4x + 2y = -30$

3) $x - y = 11$
$2x + y = 19$

4) $-6x + 5y = 1$
$6x + 4y = -10$

5) $-2x - 9y = -25$
$-4x - 9y = -23$

6) $8x + y = -16$
$-3x + y = -5$

7) $5x + 4y = -30$
$3x - 9y = -18$

8) $-4x - 2y = 14$
$-10x + 7y = -25$

9) $5x + y = 9$
$10x - 7y = -18$

10) $2x + 8y = 6$
$-5x - 20y = -15$

11) $-3x + 7y = -16$
$-9x + 5y = 16$

12) $-7x + y = -19$
$-2x + 3y = -19$

4-Step Method:

1. Define variables
2. Write the system of equations
3. Solve showing all steps
4. State your solution in sentence form

1. You sell tickets for admission to your school play and collect a total of $104. Admission prices are $6 for adults and $4 for children. You sold 21 tickets. How many adult tickets and how many children tickets did you sell?

2. Your family goes to a restaurant for dinner. There are 6 people in your family. Some order the chicken dinner for $14.80 and some order the steak dinner for $17. If the total bill was $91, how many people ordered each type of dinner?

3. You bought the meat for Saturday's cookout. A package of hot dogs cost $1.60 and a package of hamburger cost $5. You bought a total of 8 packages of meat and you spent $23. How many packages of hamburger meat did you buy?

4. Casey orders 3 pizzas and 2 orders of breadsticks for a total of $29.50. Rachel orders 2 pizzas and 3 orders of breadsticks for a total of $23. How much does a pizza cost?

5. Rent-A-Car rents compact cars for a fixed amount per day plus a fixed amount for each mile driven. Benito rented a car for 6 days, drove it 550 miles, and spent $337. Lisa rented the same car for 3 days, drove it 350 miles, and spend $185. What is the charge per day and the charge per mile for the compact car?

6. Beach Hotel In Cancun is offering two weekend specials. One includes a 2-night stay with 3 meals and cost $195. The other includes a 3-night stay with 5 meals and cost $300. What is the cost of a single meal?
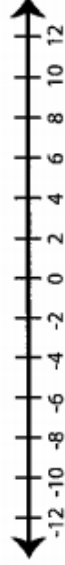
SOLVING & GRAPHING 1 VARIABLE INEQUALITIES

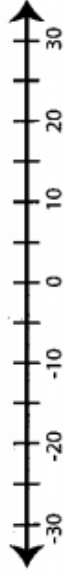Solve each inequality and graph the solution   in 2 ways- interval and inequality notation

1) $-1 > \dfrac{x+4}{2}$

[number line: -18 -9 0 9 18]

2) $-2x + 8 \leq 24$

[number line: -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12]

3) $-6x - 13 \geq 17$

[number line: -30 -20 -10 0 10 20 30]

4) $16 < \dfrac{x}{4} + 9$

[number line: -28 -14 0 14 28 42 56]

5) $-5x \leq -8x + 21$

[number line: -2 0 2 4 6 8 10]

6) $5 \geq -3x - 10$

[number line: -40 -30 -20 -10 0 10 20]
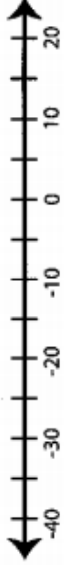
7) $9x + 8 < 44$

a) $(4, \infty)$ b) $(-\infty, 4]$

c) $(-\infty, 4)$ d) $[-4, \infty)$

8) $\dfrac{x}{3} + 2 \geq 18$

a) $(-\infty, 48]$ b) $(-\infty, 48)$

c) $(48, \infty)$ d) $[48, \infty)$

9) $\dfrac{x+12}{3} \leq 7$

a) $(-\infty, 9]$ b) $[9, \infty)$

c) $(-\infty, 9)$ d) $[-9, \infty)$

10) $10x - 5 > 15$

a) $(-\infty, 2]$ b) $[2, \infty)$
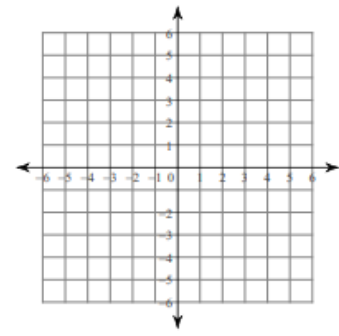
c) $(2, \infty)$ d) $[-2, \infty)$

Sketch the graph of each linear inequality.   Name at least one solution for each problem.
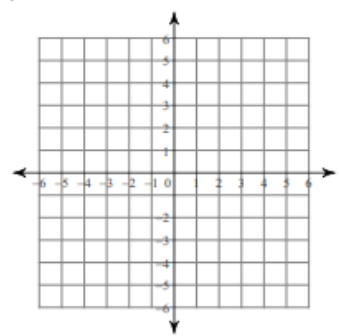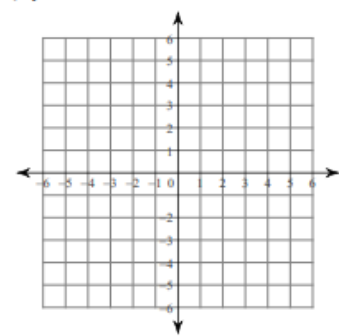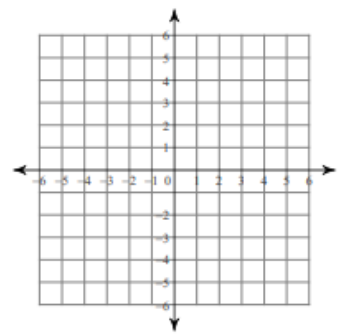
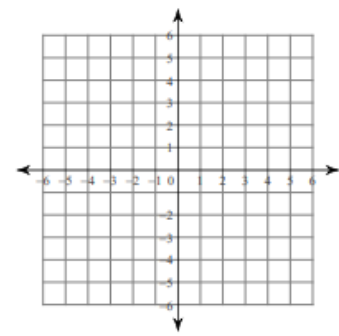1) $y \geq -2x - 2$
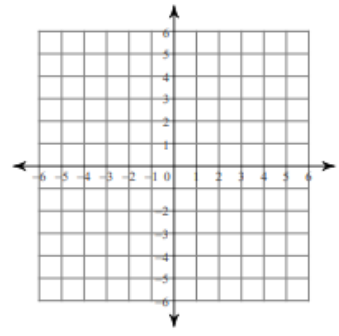
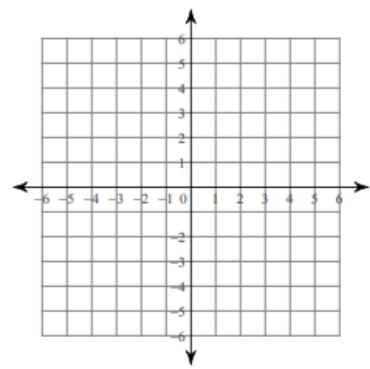2) $y \leq -\frac{1}{3}x + 1$

3) $x \geq -2$

4) $y < x - 2$

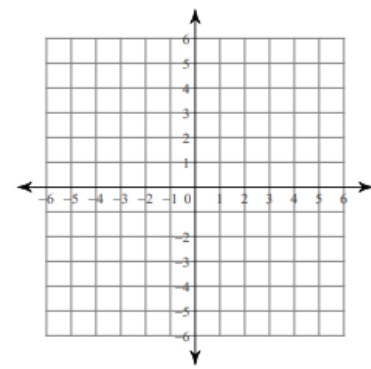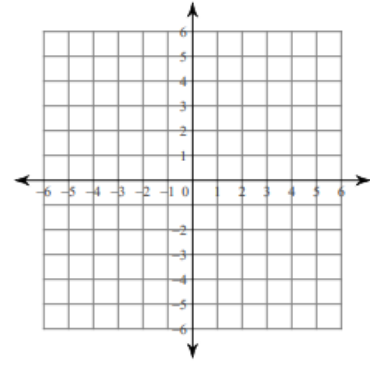5) $y \geq x - 2$

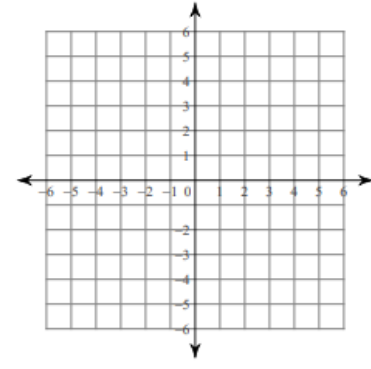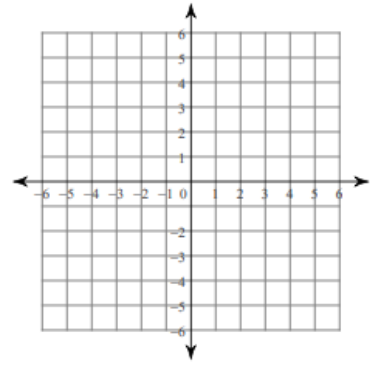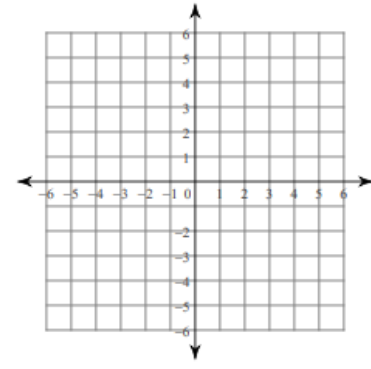6) $y < 6x + 1$

7) $5x - y \geq 5$

8) $x + 3y \geq 3$
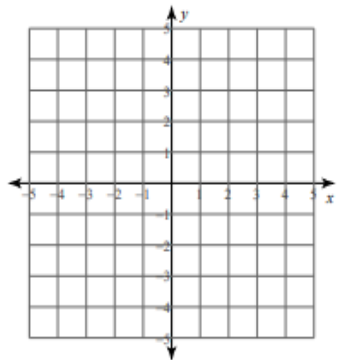
9) $y \geq 5$

10) $2x - 5y \leq 10$
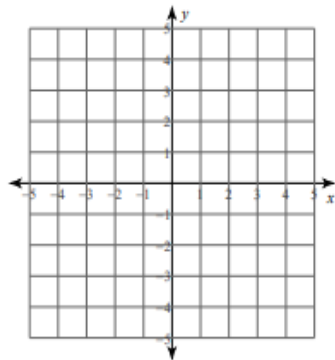
11) $8x - 3y \leq 12$

12) $x - y \geq 0$

Sketch the solution to each system of inequalities. **Name at least one solution for system.**
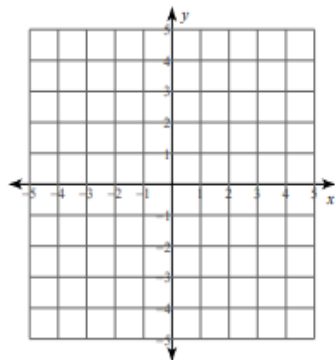
1) $y \leq -x - 2$
   $y \geq -5x + 2$
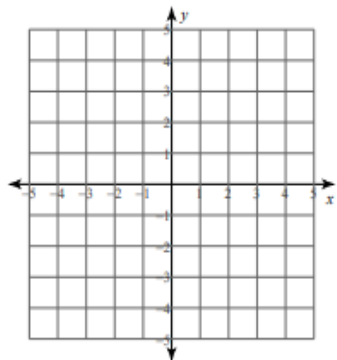
2) $y > -x - 2$
   $y < -5x + 2$

5) $y \leq -\dfrac{5}{2}x - 2$
   $y < -\dfrac{1}{2}x + 2$

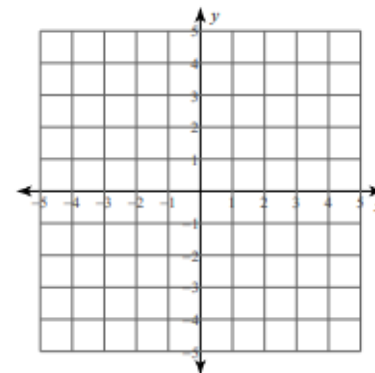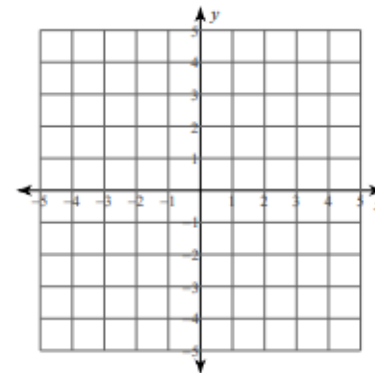6) $y \geq \dfrac{2}{3}x + 3$
   $y > -\dfrac{4}{3}x - 3$

3) $y \leq \dfrac{1}{2}x + 2$
   $y < -2x - 3$

4) $x \leq -3$
   $y < \dfrac{5}{3}x + 2$

7) $4x + y < 2$
   $y > -2$

8) $3x + 2y \geq -2$
   $x + 2y \leq 2$

Suppose you have two jobs, babysitting, which pays $5 per hour, and bagging groceries, which pays $6 per hour. You can work no more than 20 hours each week, but you need to earn at least $90 per week. How many hours can you work at each job?

Let x = the number of hours babysitting _____
Let y = the number of hours bagging groceries
Write a system of inequalities to represent the situation. _____

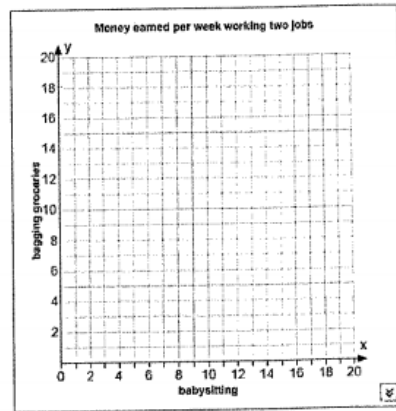Place each inequality in graphing form and graph.

y _____

y _____

How many hours can you work at each job?
(Give at least two possible solutions and explain.)

Ordered pair: _____
Explanation: _____

Ordered pair: _____
Explanation: _____

Money earned per week working two jobs

Jason is buying wings and hot dogs for a party. One package of wings costs $7. Hot dogs cost $4 per pound. He must spend less than $40. Write an inequality to represent the cost of Jason's food for the party.
Let x=# of packages of wings and y=# of pounds of hot dogs

_____

Jason knows that he will be buying at least 5 pounds of hot dogs. Write an inequality to represent this situation.
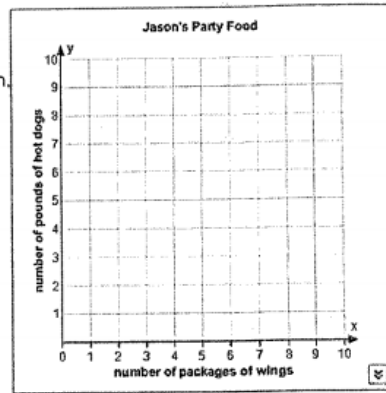
_____

Graph the system and give two possible solutions for Jason.

y _____

y _____

Solutions:

Ordered pair: _____
Explanation: _____

Ordered pair: _____
Explanation: _____

Jason's Party Food

1. Marsha is buying plants and soil for her garden. The soil (x) costs $4 per bag, and the plants (y) cost $10 each. She wants to buy at least 4 plants, and she can spend no more than $100.

A. Write a system of linear inequalities to model the situation (and put in slope-intercept form) and then graph.

B. Can Marsha buy 2 bags of soil and 5 plants? Explain your answer.

C. Can Marsha buy 3 bags of soil and 10 plants? Explain your answer.

D. Can Marsha buy 1 bag of soil and 3 plants? Explain your answer.

number of plants

bags of soil