

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

#### 4.1 B Linear Inequalities – Application Problems

Mr. Vance is organizing a field trip and is trying to figure out which vehicles to rent. He will need to transport at least 61 people, since that is the number of people going on the trip. A van can seat 5 people and a bus can seat 30 people.

Select the inequality in standard form that describes this situation. Use the given numbers and the following variables.

$x$  = the number of vans rented  
 $y$  = the number of buses rented

- ☐  $30x \cdot 5y \geq 61$
- ☐  $30x + 5y \geq 61$
- ☐  $5x \cdot 30y \geq 61$
- ☐  $5x + 30y \geq 61$

Mrs. Howard is ordering senior portraits of her son to send to their relatives. A medium photo costs \$16 and a large photo costs \$36. She wants to spend less than \$250 in total.

Select the inequality in standard form that describes this situation. Use the given numbers and the following variables.

$x$  = the number of medium photos  
 $y$  = the number of large photos

- ☐  $16 + x + 36 + y > 250$
- ☐  $16x + 36y > 250$
- ☐  $16x + 36y < 250$
- ☐  $16 + x + 36 + y < 250$

Jim is ordering Italian takeout for a big game night with 25 guests in attendance. A family-size lasagna will feed at least 5 guests and an extra-large one will feed at least 11 guests.

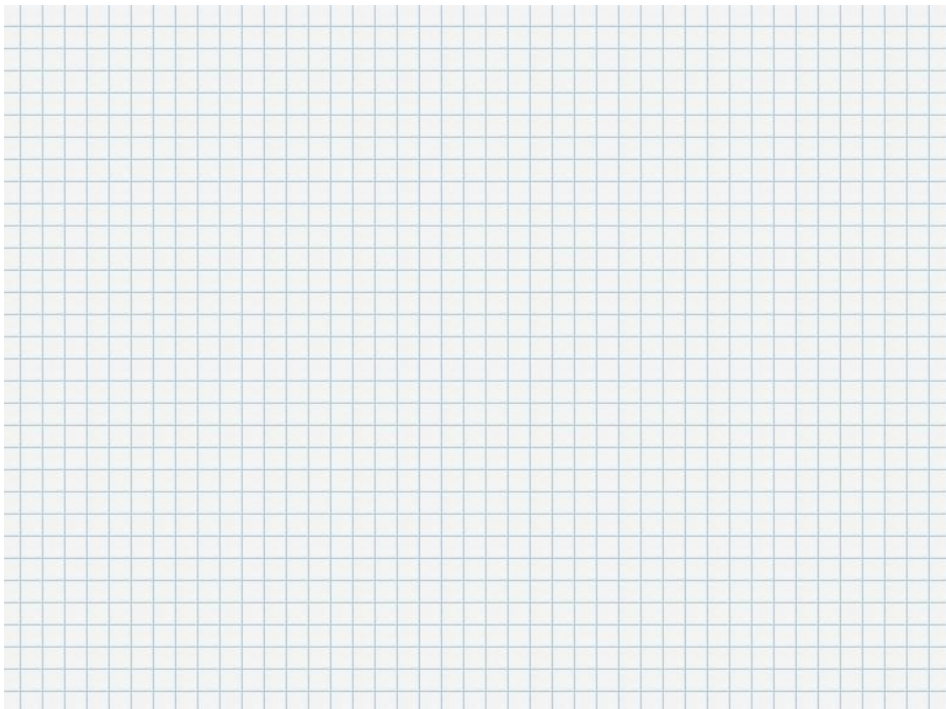
Select the inequality in standard form that describes this situation. Use the given numbers and the following variables.

$x$  = the number of family-size lasagnas  
 $y$  = the number of extra-large lasagnas

- ☐  $5x + 11y \leq 25$
- ☐  $5 + x + 11 + y \leq 25$
- ☐  $5 + x + 11 + y \geq 25$
- ☐  $5x + 11y \geq 25$

On the first day of spring, Garden World sold more than \$5000 worth of ornamental trees. Six-foot maple trees cost \$200 each and Five-foot which birch trees cost \$250 each.

- a. Set up and write an inequality that shows the possible number of maple trees ( $x$ ) and birch trees ( $y$ ) that were sold.



- b. Graph the inequality.

- c. If no birch trees were sold, what is the least amount of red maple trees that could have been sold? (solve algebraically, check graph)

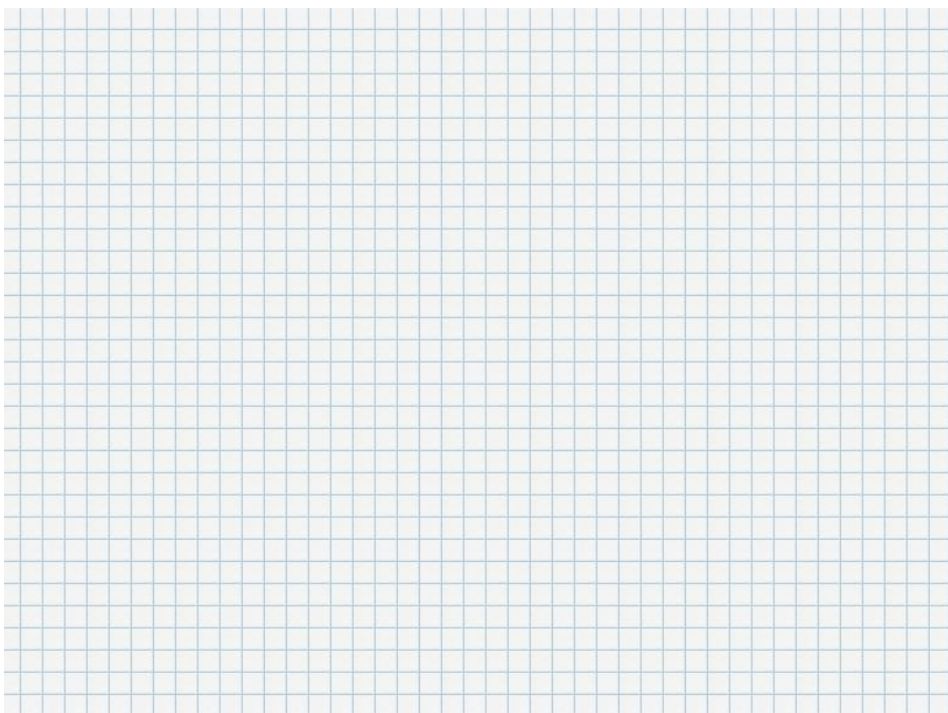
- d. If the sales results are represented by an ordered pair, what would  $(21, 13)$  mean?

- e. If the sales results are  $(21, 13)$ , what is the value Garden World exceeded the \$5000?

Retirees ages 62 to 65 can earn as much as \$15,120 and still receive their full Social Security benefits. If their annual earnings exceed \$15,120, then their benefits are reduced. Charlie, who is 64 and retired, works 2 part-time jobs: one in the evening answering phones at Tasta Pizza and a morning job as a barista at Tim Hortons. Tasta Pizza pays \$360 for a 5-day week; Tim Hortons pays \$540 for a 7-day week.

- a. Write an inequality representing the number of weeks Charlie can work at each job during the year without losing any of his Social Security benefits. Use  $(x)$  for the weeks at Tasta Pizza and  $(y)$  for the weeks at Tim Hortons.

- b. Graph the inequality.



- c. What is the maximum number of weeks Charlie could work at Tasta Pizza?

- d. What is the maximum number of weeks Charlie could work at Tim Horton's?

- e. What does  $(30, 20)$  mean for this problem? Is it a possible solution for Charlie? Explain.