

Do Now: A soccer ball is kicked into the air from the ground. The height,  $h$ , of the ball after  $t$  seconds can be represented by the equation  $h = -8t^2 + 60t$ . What is the maximum height the ball will reach?

9JUN14



factoring

$$h = -8t^2 + 60t$$

$$0 = 4t(-2t + 15)$$

$$4t = 0$$

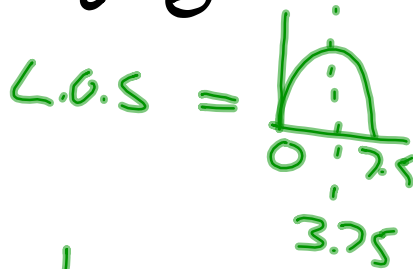
$$t = 0$$

or

$$-2t + 15 = 0$$

$$\Rightarrow -2t = -15$$

$$\Rightarrow t = 7.5$$



$$h = -8(3.75)^2 + 60(3.75) = 112.5$$

maximum height is: \_\_\_\_\_

L.O.S.  
 $= \frac{-b}{2a}$

$$h = -8t^2 + 60t$$

$$a = -8 \quad b = 60 \quad c = 0$$

$$x = \frac{-b}{2a} = \frac{-60}{2(-8)} = \frac{-60}{-16} = 3.75$$

$$h = -8(3.75)^2 + 60(3.75) \\ = 112.5$$

maximum height is: \_\_\_\_\_

***Last review practice for linear systems of inequalities. Begin working on ACE 5 page 78:***

***#9 and 11 or***

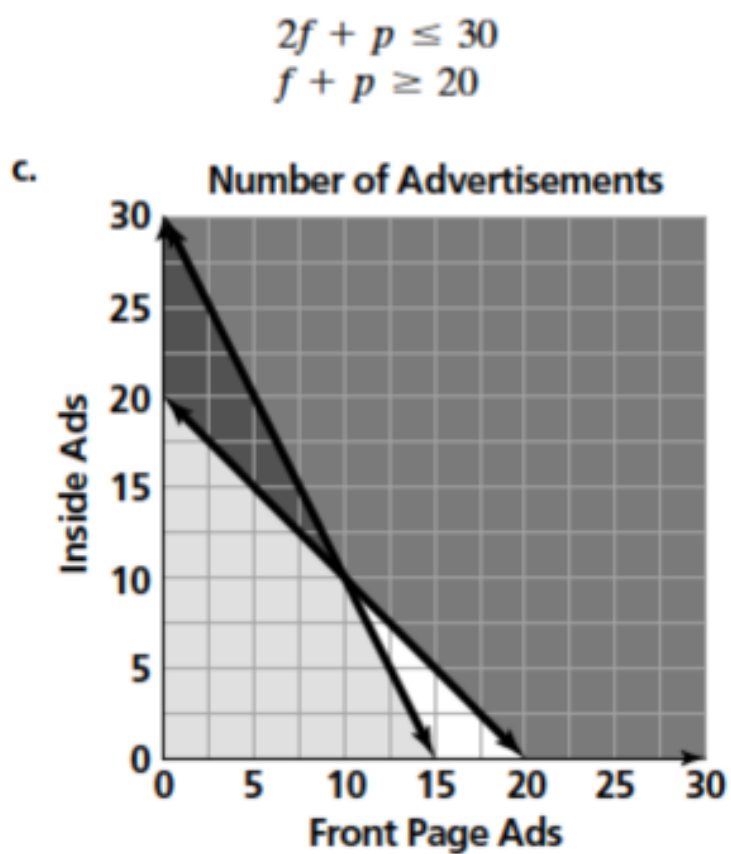
***#10 and 12***

- 9.** Math Club members want to advertise their fundraiser each week in the school paper. They know that a front-page ad is more effective than an ad inside the paper. They have a \$30 advertising budget. It costs \$2 for each front-page ad and \$1 for each inside-page ad. The club wants to advertise at least 20 times.
- a.** What are some possibilities for the numbers of front-page ads and inside-page ads the club can place?
  - b.** Write a system of linear inequalities to model this situation.
  - c.** Graph your system of inequalities. Be sure it is clear which region shows the solution.

9. a. Answers may vary, but they can advertise 20 times inside the paper and 5 times on the front page; or they can advertise 10 times on the front page and 10 times inside the paper; or they can advertise 30 times on the inside of the paper and never on the front page.
- b. Let  $f$  be the number of times they advertise on the front page and let  $p$  be the number of times they advertise inside the paper. We know  $f \geq 0$  and  $p \geq 0$ . Also:

$$2f + p \leq 30$$

$$f + p \geq 20$$



Note that students may choose different axes for their graphs.

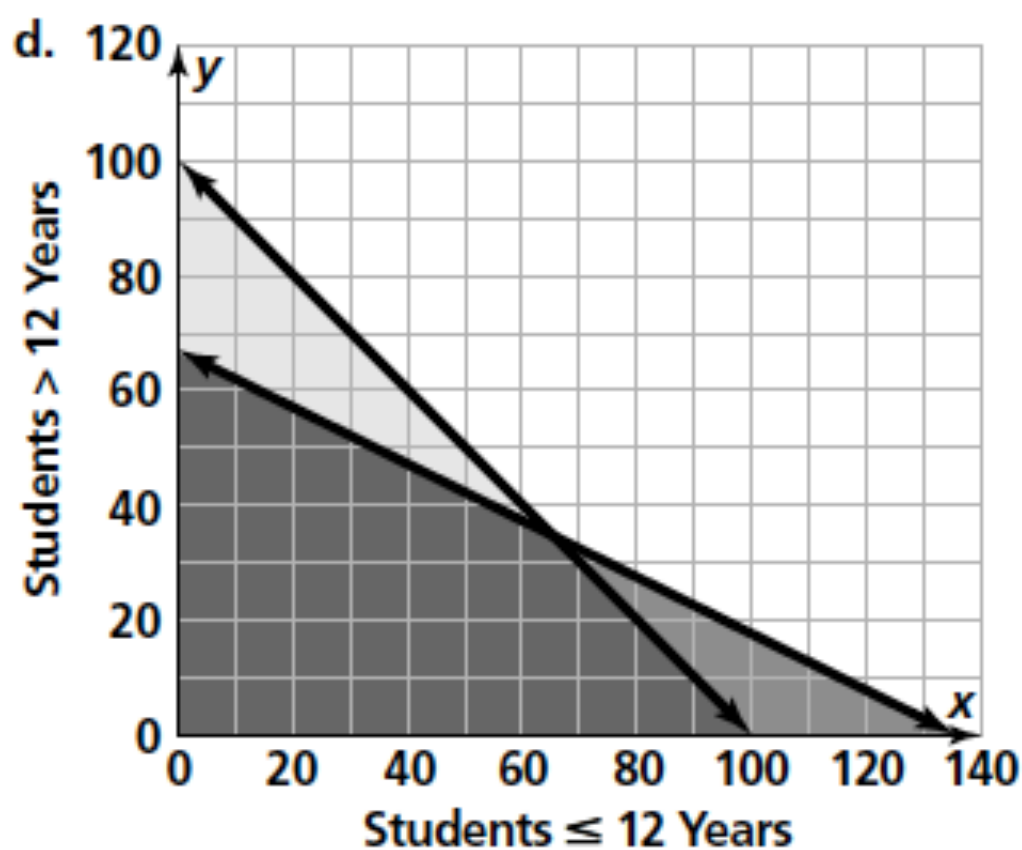
- 10.** The science club can spend at most \$400 on a field trip to a dinosaur exhibit. It has enough chaperones to allow at most 100 students to go on the trip. The exhibit costs \$3.00 for students 12 years and under and \$6.00 for students over 12.
- a.** How many students 12 years and under can go if no students over 12 go?
  - b.** How many students over 12 can go if no students 12 or under go?
  - c.** Write a system of linear inequalities to model this situation.
  - d.** Graph your system of inequalities. Be sure it is clear which region shows the solution.



10. a. If no students older than 12 go on the trip, then as many as 100 students can go. This is within the budget of \$400, and they are limited by the number of chaperones.
- b. If no students 12 or younger go, then 66 students can go. This is because they are limited by the \$400 budget.
- c. Let  $x$  be the number of students 12 and younger going on the trip. Let  $y$  be the number of students older than 12 going on the trip. Then  $x \geq 0$  and  $y \geq 0$ . Also:

$$3x + 6y \leq 400$$

$$x + y \leq 100$$



Note: students may choose different axes for their graphs.

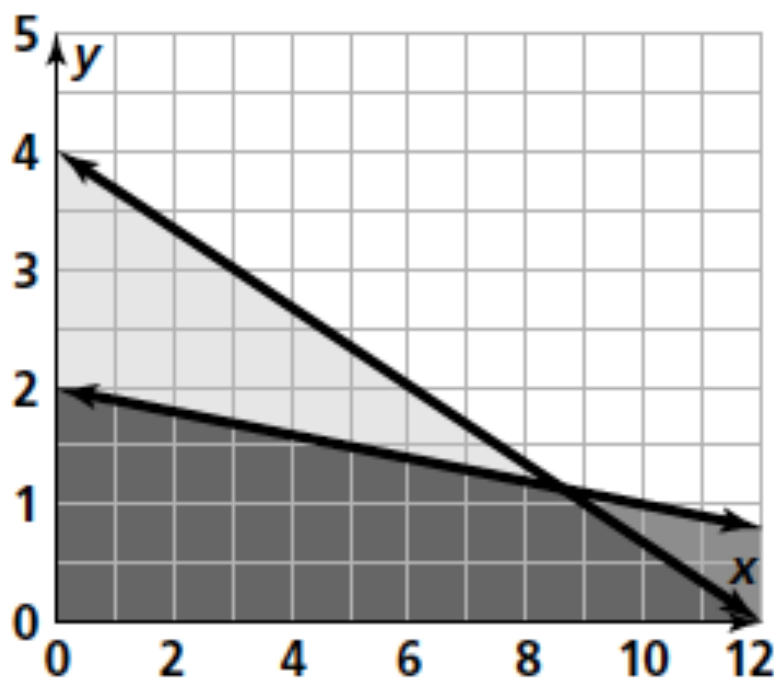
**Find three  $(x, y)$  pairs that satisfy the system of inequalities and three  $(x, y)$  pairs that do not. Then, draw a graph showing all the solutions.**

**11.** 
$$\begin{cases} 4x + 6y \leq 24 \\ x + 5y \leq 10 \end{cases}$$

**12.** 
$$\begin{cases} 2x - y \leq 4 \\ -x + y > -1 \end{cases}$$

**11.** Answers will vary. Possible solutions include  $(0, 0)$ ,  $(1, 1)$ ,  $(-1, -1)$ .

Answers will vary. Possible non-solutions include  $(1, 2)$ ,  $(2, 4)$ ,  $(3, 6)$ .



12. Answers will vary. Possible solutions include  $(0, 3)$ ,  $(-1, 1)$ ,  $(-2, 0)$ .

Answers will vary. Possible non-solutions include  $(3, 0)$ ,  $(0, -2)$ ,  $(1, -3)$ .

