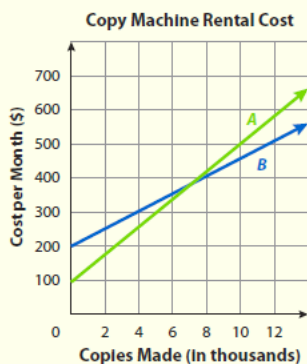## Chapter 8 Test Review

For Exercises 1–4, fill in the blank.

1. A system of equations that has no solutions is called a(n) _inconsistent_ system.

2. A system of equations that has infinitely many solutions is called a(n) _dependent_ system.

3. The boundary of the graph of a "greater than" or "less than" inequality is drawn as a(n) _dashed_ line.

4. The boundary of the graph of an inequality that includes an equal sign is drawn as a(n) _solid_ line.

5. On the graph of an inequality, explain how you can decide which side of a boundary to shade. _Choose any pt. not on boundary line. If it creates a true statement, shade the area the pt. lies in. If it does not satisfy the inequality, then shade the other area._

6. This graph was made to compare the costs of renting copy machines from Company A and Company B. What information does the point of intersection of the two lines give?

Copy Machine Rental Cost

The intersection shows the # of copies for which the two companies would cost the same per month.

For Exercises 7–10, solve the system of equations. Identify any system that is either inconsistent or dependent.

7. $2x + y = -4$ $y = -2x - 4$
   $5x + 3y = -6$

$5x + 3(-2x-4) = -6$

$5x - 6x - 12 = -6$

$-x = 6$

$x = -6$

$2(-6) + y = -4$

$y = 8$

$\boxed{(-6, 8)}$

8. $3x = 5y + 2$
   $15y = 9x - 6$

$3(3x - 5y = 2)3$

$-9x + 15y = -6$

$9x - 15y = 6$
$-9x + 15y = -6$
$0 = 0$

$\boxed{\begin{array}{l}\text{dependent} \\ \infty \text{ many solutions}\end{array}}$

9. $-2x + 3y = 12$
$2x + 7y = 8$

$10y = -4$

$y = -\frac{2}{5}$

$2x - 3\left(\frac{-2}{5}\right) = 12$

$2x + \frac{6}{5} = \frac{60}{5}$

$2x = \frac{54}{5}$

$x = \frac{27}{5}$ $\boxed{\left(\frac{27}{5}, \frac{-2}{5}\right)}$

10. $x - 2y = 8$
$3x - 5 = 6y$

$x = 2y + 8$

$3(2y + 8) - 5 = 6y$

$6y + 24 - 5 = 6y$

$19 \neq 0$

$\boxed{\text{Inconsistent (no solution)}}$

11. You are the owner of a shop that designs and sells T-shirts. You can buy plain shirts from a local retailer and pay 8.25% sales tax. Another option is to order shirts at the same price from an online wholesaler in another state, who is not required to collect sales tax. But the wholesaler charges a processing fee of $13 per order, plus 5% of the price of the shirts for shipping and handling.

   a. Write a system of equations that describes your options. Represent the value of the shirts purchased by p, and the additional costs for each order by C.

   b. Solve the system using a graph or table. Check your answer with an algebraic method.

   c. What does the solution mean in this context? **It will cost $33 to purchase 400 T-shirts.**

   d. If you plan to order $300 worth of materials, which option is cheaper? **The retailer**

   e. If you plan to order $500 worth of materials, which option is cheaper? **The wholesaler**

retailer
$C_1 = .0825p$
$C_2 = .05p + 13$
wholesaler

$.0825p = .05p + 13$
$.0325p = 13$
$p = 400$
$C = 33$
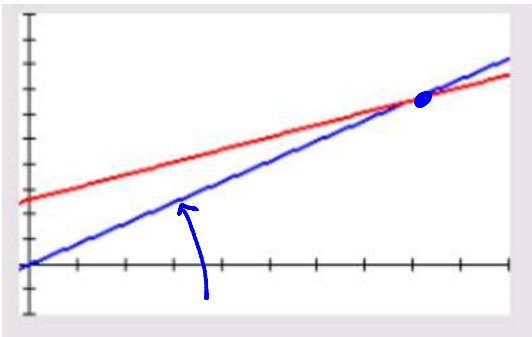
X	Y₁	Y₂
395	32.588	32.75
396	32.67	32.8
397	32.753	32.85
398	32.835	32.9
399	32.918	32.95
400	33	33
401	33.083	33.05
402	33.165	33.1
403	33.248	33.15
404	33.33	33.2
405	33.413	33.25

12. One store charges $1.60 for a photo print order, plus $0.10 per print. Another charges $1.20, plus $0.15 per print. For how many prints is the total cost the same?

$C = .10p + 1.60$
$C = .15p + 1.20$

$.10p + 1.60 = .15p + 1.20$

$10p + 160 = 15p + 120$

$40 = 5p$

$8 = p$

The total cost would be the same for 8 prints.

13. A florist has 600 daisies and 450 irises with which to create some floral arrangements. She has decided on two basic combinations: the bargain assortment will contain 8 daisies and 3 irises, while the deluxe assortment will contain 4 daisies and 6 irises.

   a. She wants to use all of the available flowers. Write a system of equations that will allow her to determine how many bargain b and deluxe d assortments to make.

   b. How many of each type of arrangement will use all of the available flowers?

$$8b + 4d = 600 \xrightarrow{\div 4} (2b + d) = (150) \cdot -6$$
$$3b + 6d = 450 \qquad\qquad 3b + 6d = 450$$

$$-12b - 6d = -900$$
$$3b + 6d = 450$$
$$\overline{\qquad\qquad\qquad}$$
$$-9b = -450$$
$$b = 50$$
$$d = 50$$

> 50 Bargain arrangements
> 50 Deluxe arrangements

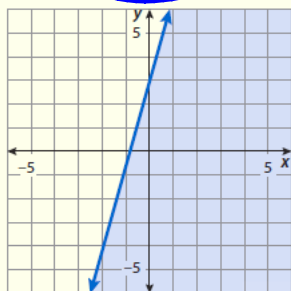**14.** Which graph represents the inequality $3y \le x + 6$?

$$y \le \tfrac{1}{3}x + 2$$
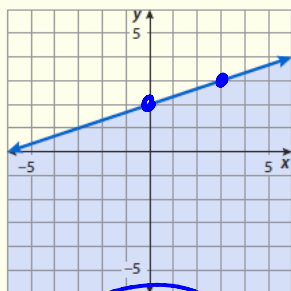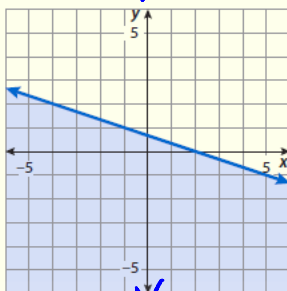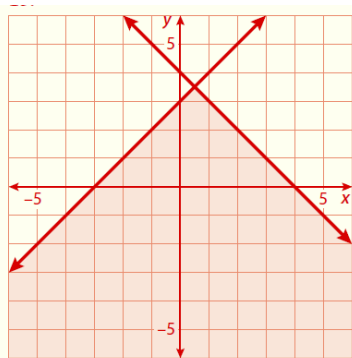
Graph A
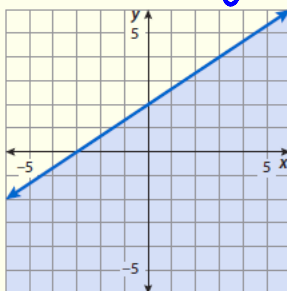
Graph B

Graph C

Graph D

15. Draw a graph of the solution set for the following system of inequalities:
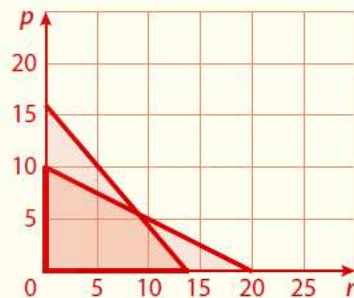
$$y \le x + 3$$
$$x + y \le 4$$

16. A loaf of rye bread requires 3 cups of flour and $\frac{1}{2}$ cup of sugar. A loaf of pumpernickel bread requires $2\frac{1}{2}$ cups of flour and 1 cup of sugar. You have 40 cups of flour and 10 cups of sugar.

  a. Write a system of inequalities that models the numbers of loaves of rye r and pumpernickel p that could be baked.

  b. Graph the system of inequalities.

$$3r + 2.5p \le 40$$
$$.5r + p \le 10$$
$$r \ge 0$$
$$p \ge 0$$

# of loaves of pumpernickel

# of loaves of rye