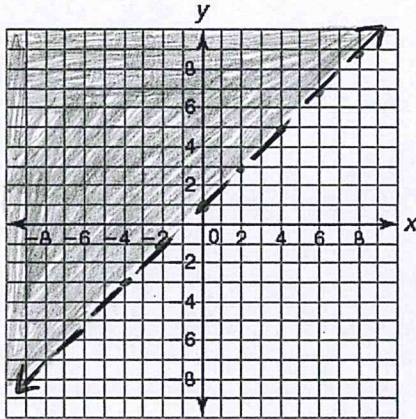**Graph each linear inequality.**

33. $y > x + 1$

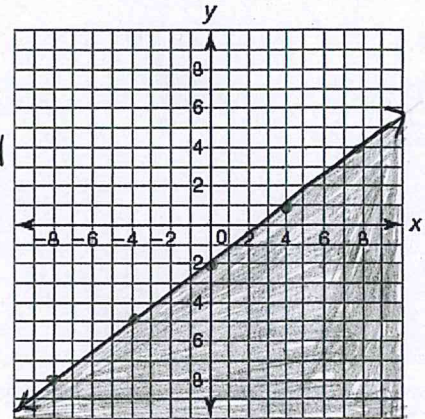**34.** $3x - 4y \geq 8$

$$\frac{-4y}{-4} \geq \frac{-3x}{-4} + \frac{8}{-4}$$

$$y \leq \frac{3}{4}x - 2$$

Graph each inequality and determine if the ordered pair is a solution for the problem situation.

35. Marcus has 50 tokens to spend at the school carnival. The Ferris wheel costs 7 tokens and the carousel costs 5 tokens. The inequality $7x + 5y \leq 50$ represents the possible ways Marcus could use his tokens on the two rides. Is the ordered pair (6, 3) a solution for the problem situation?
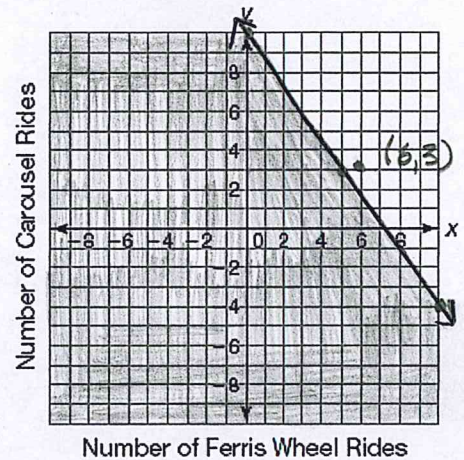
$$7x + 5y \leq 50$$
$$5y \leq -7x + 50$$
$$y \leq -\frac{7}{5}x + 10$$

$$7(6) + 5(3) \overset{?}{\leq} 50$$
$$42 + 15 \leq 50$$
$$57 \not\leq 50$$

(6,3) is not a solution

Number of Carousel Rides (y-axis)
Number of Ferris Wheel Rides (x-axis)

Write a linear inequality in two variables to represent each problem situation.

36. Tanya is baking zucchini muffins and pumpkin muffins for a school event. She needs at least 500 muffins for the event.   x = zucchini muffins
y = pumpkin muffins

$$x + y \overset{\geq}{\geq} 500$$

37. Patti makes decorative flower pots. It costs her $20 to purchase the materials for each pot. She wants to charge more than $6 per hour of labor plus her materials cost for each pot.
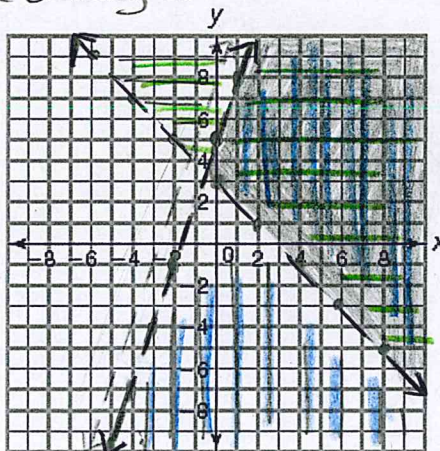
x = hourly rate
y = how much she charges

$$6x + 20 \leq y$$
$$y > 6x + 20$$

38. Graph the system of inequalities.

$$\begin{cases} y < 3x + 5 \\ y > -x + 3 \end{cases}$$

39. Carlos works at a movie theater selling tickets. The theater has (300) seats and charges ($7.50) for adults and $5.50 for children. The theater expects to make at least ($2000) for each showing. Write a system of inequalities to represent this situation. You do not have to solve.

$x =$ # of adults

$y =$ # of children

$x + y \le 300$

$7.5x + 5.5y \ge 2000$

40. Is the point (-2, -10) a solution to the system of inequalities? $\begin{cases} 2x - y > 4 \\ -x + y \le 7 \end{cases}$

$2(-2) - (-10) > 4 \qquad -(-2) + (-10) \le 7$

$-4 + 10 > 4 \qquad\qquad 2 - 10 \le 7$

$6 > 4 \checkmark$ Yes! $\qquad -8 \le 7 \checkmark$ Yes!

(-2, 10) is a solution.

41. Write a quadratic function that represents a parabola that opens downward and has x-intercepts $(-2, 0)$ and $(5, 0)$.

$f(x) = -(x + 2)(x - 5)$

42. What are the x-intercepts of the function $f(x) = (x - 2)(x - 8)$?

$x - 2 = 0 \qquad x - 8 = 0$

$x = 2 \qquad\qquad x = 8$

The x-intercepts are $(2, 0)$ and $(8, 0)$.

43. Factor to determine the x-intercepts. $f(x) = x^2 + 8x + 12$

$f(x) = x^2 + 8x + 12$

$\dfrac{6 \cdot 2}{6 + 2} = 12$

$= 8$

Factors

1, 12   3, 4

(2, 6)

$f(x) = (x + 2)(x + 6)$

$x + 2 = 0 \quad x + 6 = 0$
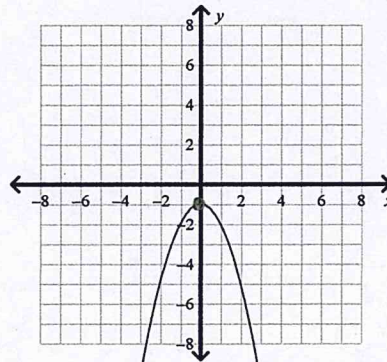
$x = -2 \quad x = -6$

$(-2, 0)$ and $(-6, 0)$

44. What are the coordinates of the vertex of the graph? Is it a maximum or minimum?
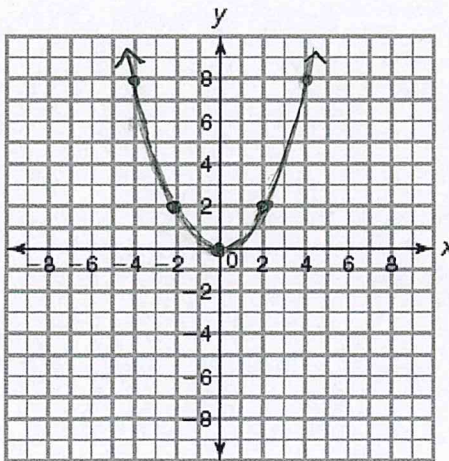
Vertex: $(0, -1)$

maximum

45. Graph the function $y = 0.5x^2$. State the domain and range.

Domain: All real numbers

Range: $y \ge 0$

x	$y = 0.5x^2$
-4	$0.5(-4)^2 = 8$
-2	$0.5(-2)^2 = 2$
0	0
2	$0.5(2)^2 = 2$
4	$0.5(4)^2 = 8$

46. How is the graph of $y = -4x^2 - 5$ different from the graph of $y = -4x^2$?

$y = -4x^2 - 5$ shifts the graph $y = -4x^2$ <u>down 5 units</u>