**Graphing Linear Functions and Inequalities ⸱ Form A**

**Example 1**

**Graph each equation by using a table.**

**2.** –3 = 5*x* – *y* **4.** *y*+ *x* = 1 **6.** *y* +4*x* – 1 = 4*x* + 2

**Example 2**

**Graph each equation by using the *x*- and *y*-intercepts.**

**8.** 2*x* – 3*y* = 6 **10.** –2*x* + *y* = 4 **12.** $\frac{1}{2}$*x* + *y* = 2

**Example 3**

**Graph each equation by using *m* and *b*.**

 **14.** *y* = $\frac{2}{3}$*x* + 6 **16.** *y* – 2*x* = –1 **18.** 4 = 3*x* – *y*

**Examples 4 and 5**

**Graph each inequality.**

 **20.** *y* ≤ *x* + 2 **22.** *x* + 3 < *y* **24.** *y* ≥ –*x*

**26.** 9*x* + 3*y* – 6 ≤ 0 **28.** *y* – 7 ≤ –9 **30.** *y* – *x* > 1

**Example 6**

 **32. BUILDING CODE** A city has a building code that limits the height of buildings around the central park. The code says that the height of a building must be less than 0.1*x*,where *x* is the distance in feet of the building from the center of the park. Assume that the park center is located at
*x* = 0. Graph the inequality that represents the building code.

**34. ART** An artist can sell each drawing for $100 and each watercolor for $400. He hopes to make at least $2000 every month.

 **a.** Write an inequality that expresses how many drawings and/or watercolors the artist needs to sell each month to reach his goal.

 **b.** Graph the inequality.

 **c.** If the artist sells three watercolors one month, how many drawings would he have to sell in the same month to reach $2000?

**Mixed Exercises**

**Graph each equation or inequality.**

|  |  |  |  |
| --- | --- | --- | --- |
| **36.** *y* ≥ −3*x* – 2 | **38.** *y* + 2 = 3*x* + 3 | **40.** 4*x* – 3*y* > 12 |  |
|  |  |  |  |
|  |  |  |  |
| **42.** 2*y* – *x* = 2 | **44.** $-\frac{1}{2}$*x* + $\frac{1}{4}$*y* = 8 | **46.** *y* ≥ –43*x* + 6 |  |
|  |  |  |  |
| **48.** 2*x* – *y* = 1 | **50.** *y* + 2 = –*x* + 1 | **52.** –2*x* + 5*y* = 2 |  |

**54. ANIMALS** During the winter, a horse requires about 36 liters of water per day and a sheep requires about 3.6 liters per day. A farmer is able to supply his horses and sheep with a total of 300 liters of water each day.

 a. Write an inequality that represents the possible number of each type of animal that the farmer can keep.

 b. Graph the inequality.

 **56. BAKED GOODS** Mary sells giant chocolate chip and peanut butter cookies for $1.25 and $1.00, respectively, at a local bake shop. She wants to make at least $25 a day.

 **a.** Write and graph an inequality that represents the number of cookies Mary needs to sell
each day.

 **b.** If Mary decides to charge $1.50 for chocolate chip cookies rather than $1.25, what impact will this have on the graph of the solution set? Give an (*x*, *y*) pair that is not in the original solution set, but is in the solution set of the new revised scenario.

 **c.** How does the graph of the inequality change if Mary wants to make at least $50 a day? How does the graph of the inequality change if Mary wants to make no more than $25 a day?

**58. CONSTRUCTION** You want to make a rectangular sandbox area in your backyard. You plan to use no more than 20 linear feet of lumber to make the sides of the sandbox.

 **a.** Write and graph a linear inequality to describe this situation.

 **b.** What are two possible sizes for the sandbox?

 **c.** Can you make a sandbox that is 7 feet by 6 feet? Justify your answer.

 **d.** What can you conclude about the intercepts of your graph?

 **60. MONEY** Gemma buys candles and soaps online. The scented candles cost $9, and the hand soaps cost $4. To qualify for free shipping, Gemma will need to spend at least $50.

 **a.** Write an inequality that represents the constraints on the number of scented candles *x* and the number of hand soaps *y* that Gemma must buy in order to qualify for free shipping.

 **b.** Graph the inequality.

 **c.** Suppose Gemma decides not to buy any soaps. Determine the number of candles she needs to buy in order to qualify for free shipping. Explain.

 **d.** If Gemma decides not to buy any candles how many soaps will she need to buy in order to qualify for free shipping? Explain.

 **e.** Will Gemma qualify for free shipping if she buys 2 candles and 8 soaps? Explain how you can be sure?

 **61. FIND THE ERROR** Paulo and Janette are graphing *x* – *y* ≥ 2. Is either of them correct? Explain your reasoning.

 

**63. WRITE** You can graph a line by making a table, using the *x*- and *y*-intercepts, or by using *m* and *b*. Which method do you prefer? Explain your reasoning.

 **65. PERSEVERE** Write an equation of the line that has the same slope as 2*x* – 8*y* = 7 and the same
*y*-intercept as 4*x* + 3*y* = 15.