

12.R.2 Exercises

Concept Check

True/False. Determine whether each statement is true or false. If a statement is false, explain how it can be changed so the statement will be true. (**Note:** There may be more than one acceptable change.)

1. The y -intercept is the point where a line crosses the y -axis.
2. The terms ordered pair and point are used interchangeably.
3. A horizontal line does not have a y -intercept.
4. All x -intercepts correspond to an ordered pair of the form $(0, y)$.

Practice

Graph each linear equation by locating at least two ordered pairs that satisfy the given equation.

5. $x + y = 3$

7. $y = -3$

6. $x = 1$

Graph each linear equation by locating the x -intercept and the y -intercept.

8. $y = 4x - 10$

9. $3x - 7y = -21$

Applications

Solve.

10. **Chemistry:** The amount of potassium in a clear bottle of a popular sports drink declines over time when exposed to the UV lights found in most grocery stores. The amount of potassium in a container of this sports drink is given by the equation $y = -30x + 360$, where y represents the mg of potassium remaining after x days on the shelf. Find both the x -intercept and y -intercept, and interpret the meaning of each in the context of this problem.
11. **Education:** Mr. Adler has found that the grade each student gets in his Introductory Algebra course directly correlates with the amount of time spent doing homework, and is represented by the equation $y = 7x + 30$, where y represents the numerical score the student receives on an exam (out of 100 points) after spending x hours per week doing homework. Find the y -intercept and interpret its meaning in this context.
12. **Birth Length Prediction:** The following equation is the least squares regression line for a set of data listing the birth weight (in pounds), x , and the birth length (in inches), y , for newborn babies at a local hospital. The variable \hat{y} is the birth length the model would predict for a baby based on a birth weight of x .

$$\hat{y} = 12.343 + 0.814x$$

Predict the birth length of an 8-pound baby.

Writing & Thinking

13. Explain, in your own words, why it is sufficient to find the x -intercept and y -intercept to graph a line (assuming that they are not the same point).
14. Explain, in your own words, how you can determine if an ordered pair is a solution to an equation.