

# Graphing Linear Equations: math practice, Grade 8 – download the PDF

21 problems graded by difficulty (★ easy, ★★ medium, ★★★ hard). Try first, without looking at the solutions!

## 1 Read the slope and the y-intercept



For each equation, state the slope  $m$  and the y-intercept  $b$ .

a.  $y = 3x + 5$

b.  $y = -2x + 7$

c.  $y = \frac{x}{2} - 4$

d.  $y = -x$

## 2 Complete a table of values



Complete the table for the equation  $y = 2x - 3$ .

| $x$ | -1 | 0 | 1 | 2 | 3 |
|-----|----|---|---|---|---|
| $y$ | ?  | ? | ? | ? | ? |

### 3 Is the point on the line?



The line is  $y = x + 2$ . Decide whether each point is on the line:  $(3, 5)$ ,  $(-2, 0)$ ,  $(1, 4)$ .

### 4 Slope from two points



Find the slope of the line through each pair of points.

- a.  $(1, 2)$  and  $(4, 8)$
- b.  $(0, 5)$  and  $(3, 2)$

### 5 True or false?



Say whether each statement is true or false, and explain.

- a. The line  $y = 4$  is horizontal.
- b. The line  $x = 4$  is horizontal.
- c. The line  $y = -3x + 1$  goes down from left to right.
- d. The line  $y = 5x + 1$  is less steep than the line  $y = 0.5x + 1$ .

### 6 Build an equation



Write the equation of each line in slope-intercept form.

- a. Slope  $-3$ , y-intercept  $2$ .
- b. Slope  $4$ , crossing the y-axis at  $(0, -6)$ .
- c. Slope  $0$ , crossing the y-axis at  $(0, 7)$ .

## 7 Saving money



Maya has \$15 in her piggy bank and adds \$5 every week. Let  $y$  be the amount in dollars after  $x$  weeks.

- Write an equation for  $y$ .
- How much does she have after 6 weeks?
- What do the numbers 5 and 15 mean in this model?

## 8 Graph a line from its equation



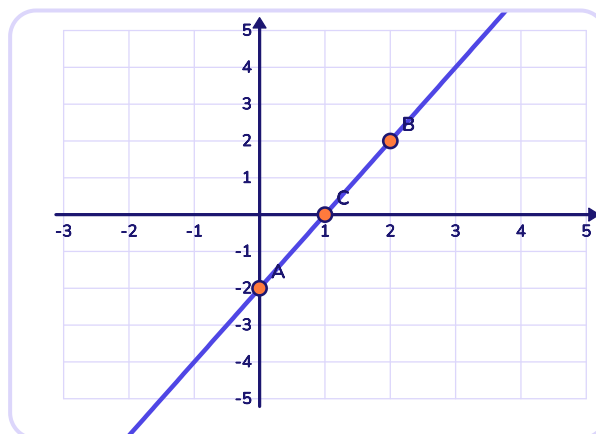
Consider  $y = -2x + 3$ .

- Make a table of values for  $x = -1, 0, 1, 2, 3$ .
- Explain how to graph the line using only the y-intercept and the slope.

## 9 Write the equation from the graph



The graph shows a line through the points A, C, and B.



- Give the y-intercept.
- Use A and B to find the slope.
- Write the equation of the line.
- Check your equation with point C.

## 10 From a table to an equation



The table shows a linear relationship.

|     |   |   |    |    |
|-----|---|---|----|----|
| $x$ | 0 | 1 | 2  | 3  |
| $y$ | 4 | 7 | 10 | 13 |

- Find the slope and the  $y$ -intercept.
- Write the equation.
- Predict  $y$  when  $x = 10$ .

## 11 Linear or not?



Decide whether each table could come from a line. If it does, write the equation.

Table 1

|     |   |   |    |    |
|-----|---|---|----|----|
| $x$ | 1 | 2 | 3  | 4  |
| $y$ | 3 | 6 | 12 | 24 |

Table 2

|     |    |   |   |    |
|-----|----|---|---|----|
| $x$ | 0  | 2 | 4 | 6  |
| $y$ | 10 | 6 | 2 | -2 |

## 12 Horizontal or vertical?



Consider the point  $P(4, -3)$ .

- Write the equation of the horizontal line through  $P$ .
- Write the equation of the vertical line through  $P$ .
- Give the slope of each line.

## 13 Taxi fare



A taxi charges a flat fee of \$3.50 plus \$2.25 for each mile. Let  $C$  be the total cost in dollars for  $m$  miles.

- Write an equation for  $C$ .
- Find the cost of an 8-mile ride.
- A passenger paid \$30.50. How many miles did the ride cover?

## 14 A fractional slope



A line has slope  $-\frac{1}{2}$  and y-intercept 5.

- Write its equation.
- Find  $y$  when  $x = 6$ .
- Describe how to plot three points of the line.

## 15 Two points, no intercept



A line passes through  $(2, 7)$  and  $(5, 16)$ . Find its equation in slope-intercept form.

## 16 From standard form to slope-intercept form



Rewrite each equation as  $y = mx + b$ , then give its slope and y-intercept.

- a.  $2x + y = 6$
- b.  $3x + 4y = 12$

## 17 Parallel lines and common points



Look at the three lines:  $y = 3x + 2$ ,  $y = -3x + 2$ , and  $y = 3x - 5$ .

- a. Which two lines are parallel? Justify.
- b. Which two lines cross the y-axis at the same point? Give that point.
- c. Write the equation of the line parallel to  $y = 3x + 2$  that passes through  $(0, -4)$ .

## 18 Draining a tank



A water tank holds 240 gallons. A pump removes 15 gallons every minute. Let  $g$  be the number of gallons left after  $t$  minutes.

- a. Write an equation for  $g$ .
- b. How much water remains after 10 minutes?
- c. When is the tank empty?
- d. What does the slope tell you? Convert 240 gallons to liters (1 gallon is about 3.785 liters).

### 19 Find the mistake



Leo graphs  $y = 3x - 2$ . He plots  $(0, 2)$  and then goes up 3 and right 1 to  $(1, 5)$ . Ana says the line  $y = 5 - 2x$  has slope 5.

- Find Leo's mistake and give the correct points.
- Find Ana's mistake and correct it.

### 20 Find the missing number



- The line  $y = kx + 4$  passes through  $(3, 13)$ . Find  $k$ .
- The line  $y = 3x + b$  passes through  $(2, -1)$ . Find  $b$ .

### 21 Choosing a gym



Gym A charges \$10 to join plus \$20 per month. Gym B has no joining fee but charges \$25 per month.

- Write an equation for the total cost of each gym after  $x$  months.
- After how many months do both cost the same? What is that cost?
- Which gym is cheaper for a 6-month plan?



**Test yourself: quick challenge for Grade 8**

Change level

Level : **Grade 8**

6 random questions, instant feedback.



**Start the challenge**



**Speed drill for Grade 8: how many in 60 seconds?**



**Keep exploring with Zyro**

 **Practice solutions**

Graphing Linear Equations: practice solutions, Grade 8

 **Math lessons**

Graphing Linear Equations: math lesson, Grade 8

 **Math quizzes**

Graphing Linear Equations: math quiz, Grade 8

 **Practice solutions**

Systems of Linear Equations: practice solutions, Grade 8

✓ **Practice solutions**

Introduction to Functions: practice solutions, Grade 8

■ **Math lessons**

Systems of Linear Equations: math lesson, Grade 8

**Zyro vous emmène sur nos sites partenaires**

Embarquez pour d'autres planètes du savoir et leurs applis.

Décollage