

# Straight Line Mission

*Draw functions from all three representations*

**GRADE 8 • 8.PFA.3.c**

**8.PFA.3.c** "Graph a linear function given a table, equation, or a situation in context."

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## BUILD UNDERSTANDING

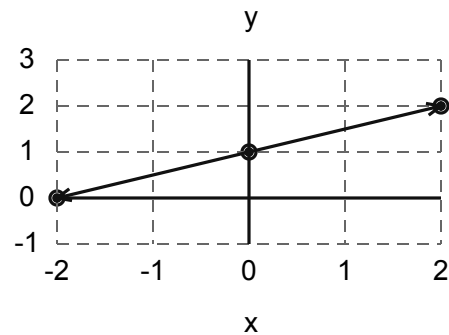
Make ordered pairs from an equation, table or situation. Read both axis scales, plot the points, and use a ruler. For abstract functions, extend the line with arrows. For contexts, show only the stated interval.

### WORKED EXAMPLE

Graph  $y = (1/2)x + 1$  using  $x = -2, 0, 2$ .

1. Substitute each  $x$ -value to find  $y$ .
2. Plot each ordered pair, then use a ruler to extend the line in both directions.

**Answer: Plot  $(-2, 0)$ ,  $(0, 1)$ ,  $(2, 2)$ , then draw the line.**



## PRACTICE 4 problems

- 1** Graph  $y = x + 2$ . List three integer-coordinate points and mark the  $y$ -intercept.

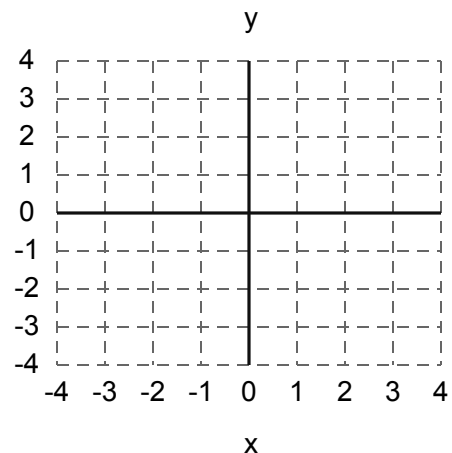
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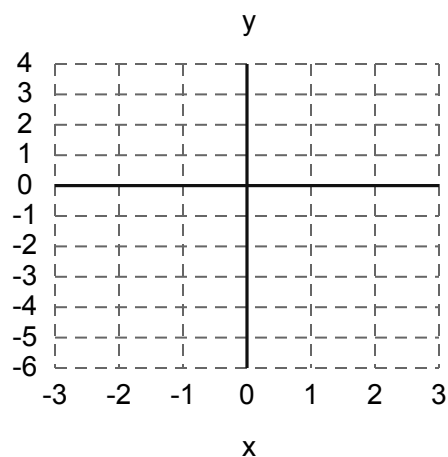


- 2** Graph the function from this table:  $x = -2, 0, 2$ ;  $y = 3, -1, -5$ . State the y-intercept.

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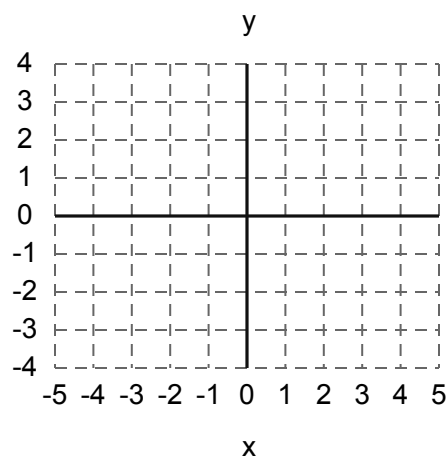


- 3** Graph  $y = -(1/2)x + 1$  using  $x = -4, 0, 4$ . Explain why you selected even x-values.

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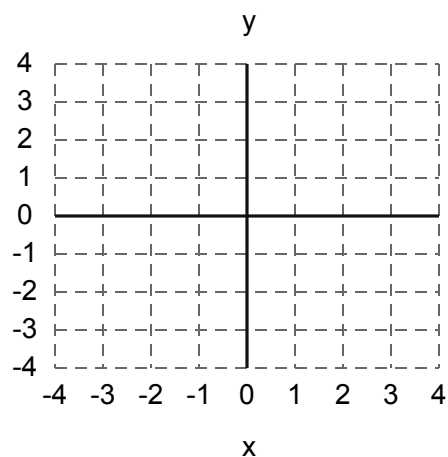


- 4** Graph the linear function shown by  $x = -3, 0, 3$  and  $y = 2, 2, 2$ . Describe its slope.

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**APPLY IT** Show your work

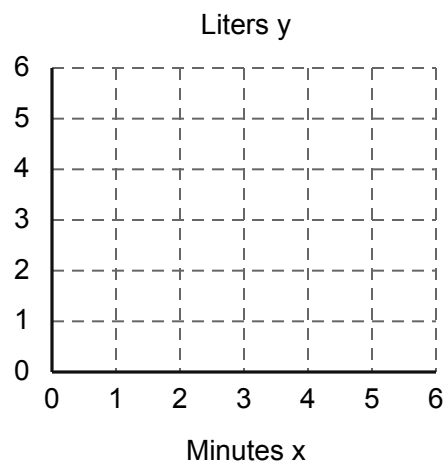
- 1** A water jug contains 6 liters and drains at 1 liter per minute. Graph volume  $y$  for time  $x$  from 0 through 6 minutes. Write its equation.

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- 2** A copy service charges a \$2 setup fee plus \$1 per poster. Model total cost  $y$  against whole-number poster count  $x$  from 0 through 5. Draw the underlying linear model and circle its six allowable whole-number inputs. Write the equation.

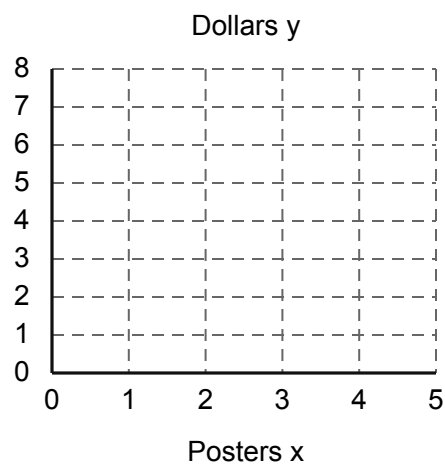
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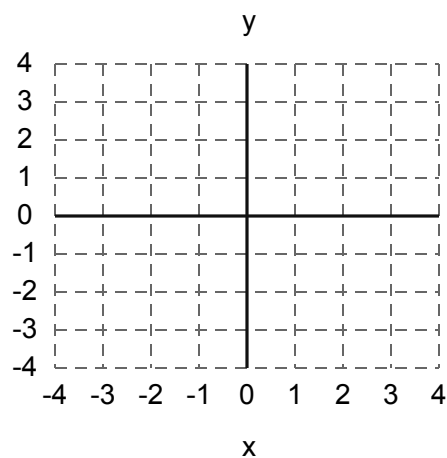
**CHALLENGE** One step up

Graph the line through  $(-2, -3)$  and  $(2, 1)$ . Use your graph and an equation to decide whether  $(3, 2)$  lies on it.

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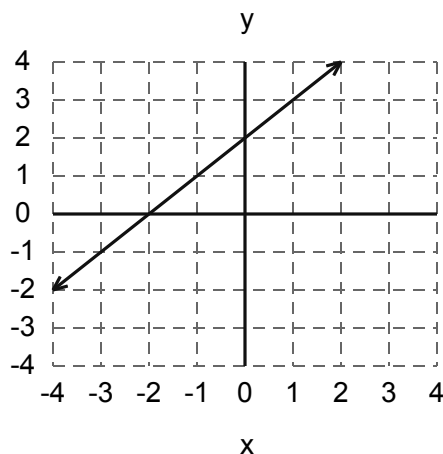
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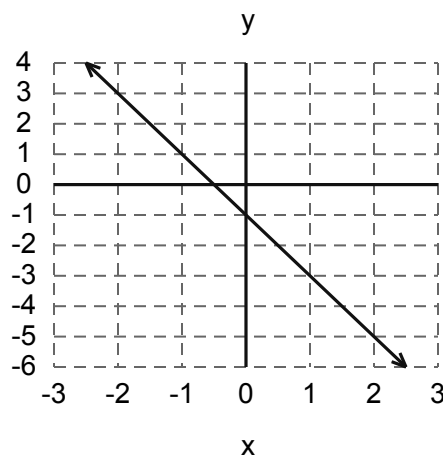
Require all seven graphs, not just listed coordinates. Accept other correct integer points. Context graphs stop at the stated endpoints. Apply It 2 distinguishes the continuous linear model from whole-number orders; dots in the key mark the allowable inputs.

**PRACTICE 1**

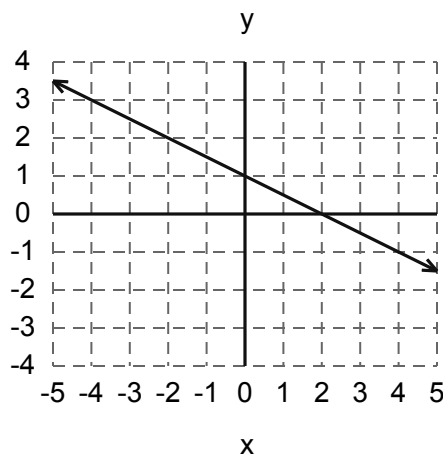
**Example points  $(-3, -1)$ ,  $(0, 2)$ ,  $(1, 3)$ ; y-intercept  $(0, 2)$ .**

**PRACTICE 2**

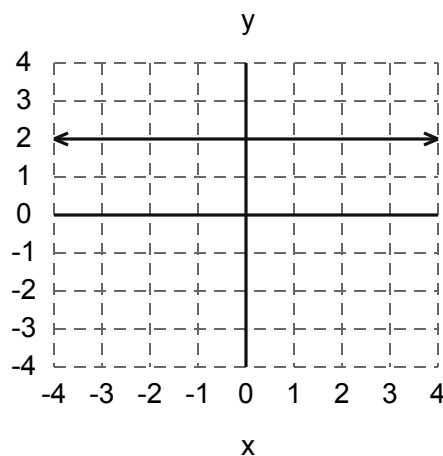
**Plot  $(-2, 3)$ ,  $(0, -1)$ ,  $(2, -5)$ ; y-intercept  $(0, -1)$ .**

**PRACTICE 3**

**$(-4, 3)$ ,  $(0, 1)$ ,  $(4, -1)$ ; even x-values give integer y-values.**

**PRACTICE 4**

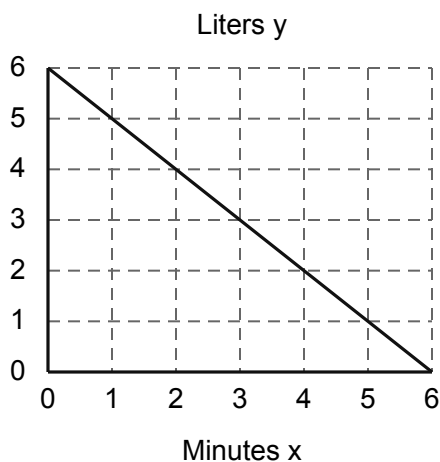
**The horizontal line is  $y = 2$ ; slope 0.**



### APPLY IT 1

$y = -x + 6$  for 0-6 minutes; endpoints (0, 6) and (6, 0).

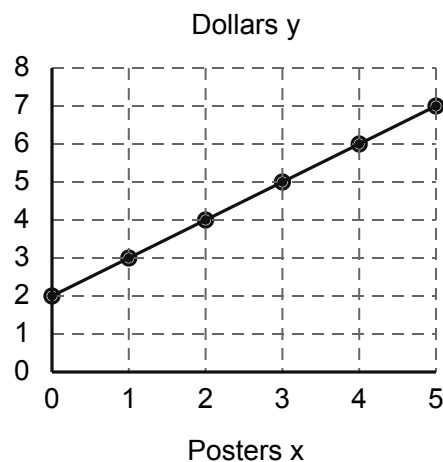
Plot several points, including (3, 3), then connect over the stated time interval.



### APPLY IT 2

$y = x + 2$ ; allowable points (0, 2), (1, 3), (2, 4), (3, 5), (4, 6), (5, 7).

The line models the rate; actual orders use only whole-number x-values.



### CHALLENGE

$y = x - 1$  passes through (-2, -3) and (2, 1). Yes:  $2 = 3 - 1$ , so the marked point (3, 2) also lies on the line.

