LESSON MAKER PRO

Function Form Switch

Use equivalent forms to reveal intercepts.

GRADE 8 · 8.FGR.5.6

8.FGR.5.6 "Write a linear function defined by an expression in different but equivalent forms to reveal and explain different properties of the function."

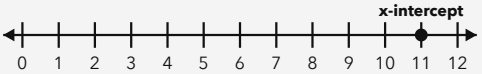
NAME _____ DATE _____

TWO USEFUL FORMS

A linear function can be written as y = mx + b or y = m(x - r). In y = mx + b, b is the y-intercept. In y = m(x - r), r is the x-intercept.

WORKED EXAMPLE

The number line marks the x-intercept of y = 9(x - 11). Write the function in y = mx + b form. Then identify the y-intercept.



1. Distribute: 9(x - 11) = 9x - 99.
2. Write y = 9x - 99.
3. The y-intercept is -99.

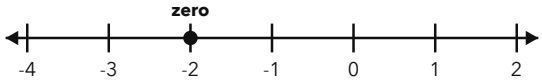
Answer: y = 9x - 99; y-intercept: -99

PRACTICE 4 problems

1 Write y = 5x - 7 in the form y = m(x - r). State the x-intercept.

ANSWER _____

2 The number line marks where y = -5(x + 2) equals 0. Write the function in y = mx + b form. Record the zero shown.



ANSWER _____

3 The number line marks the zero of y = 1/5(x - 10). Write the function in y = mx + b form. Record the zero shown.



ANSWER _____

4 Write y = -2x + 10 in the form y = m(x - r). State the x-intercept.

ANSWER _____

APPLY IT Show your work

1 You have 16 game credits and spend 2 credits each level. Let y be credits left after x levels. Write y in both forms. State what each form reveals.

WORK SPACE

ANSWER _____

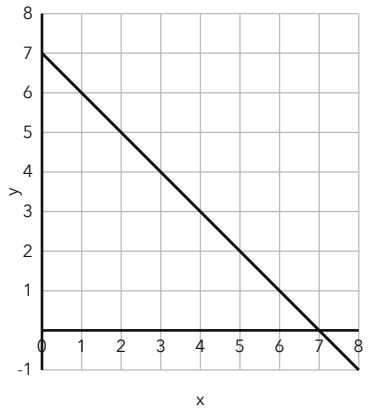
2 Your phone battery is 25% and drops 5 percentage points each hour. Let y be the battery percent after x hours. Write y in both forms. State when the battery reaches 0%.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Use the graph to write the function in y = mx + b form and y = m(x - r) form. Explain which intercept each form reveals.



WORK SPACE AND ANSWER

ANSWER KEY

Function Form Switch

GRADE 8 · 8.FGR.5.6

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write y = 5x - 7 in the form y = m(x - r). State the x-intercept.	**y = 5(x - 7/5); x-intercept: 7/5**
2	The number line marks where y = -5(x + 2) equals 0. Write the function in y = mx + b form. Record the zero shown.	**y = -5x - 10; zero: -2**
3	The number line marks the zero of y = 1/5(x - 10). Write the function in y = mx + b form. Record the zero shown.	**y = 1/5x - 2; zero: 10**
4	Write y = -2x + 10 in the form y = m(x - r). State the x-intercept.	**y = -2(x - 5); x-intercept: 5**

PART 2 · APPLY IT

1. **y = -2x + 16 = -2(x - 8). The first form shows 16 starting credits. The second form shows 0 credits after 8 levels.** Use a rate of -2 and a starting amount of 16. Factor -2 from -2x + 16.
2. **y = -5x + 25 = -5(x - 5). The battery reaches 0% after 5 hours.** Use a rate of -5 and a starting amount of 25. Factor -5 from -5x + 25.

CHALLENGE

y = -x + 7 and y = -(x - 7). The first form reveals the y-intercept, 7. The second form reveals the x-intercept, 7.

Accept equivalent correctly distributed or factored forms. For factored form, accept an equivalent form that clearly shows the zero, including y = m(x - r) with the correct nonzero multiplier.