

Zero Balance

Use opposite quantities to make a total of 0.

GRADE 7 • 7.NR.1.1

7.NR.1.1 "Show that a number and its opposite have a sum of 0 (are additive inverses). Describe situations in which opposite quantities combine to make 0."

NAME _____

DATE _____

OPPOSITES MAKE ZERO

Every number has an opposite that is the same distance from 0 on the number line, but on the other side. A number and its opposite are additive inverses because their sum is 0.

WORKED EXAMPLE

Show that -12.5 and 12.5 are additive inverses.

1. Write the addition: $-12.5 + 12.5$.
2. The numbers have equal distances from 0 and different signs.
3. Add: $-12.5 + 12.5 = 0$.

Answer: -12.5 and 12.5 are additive inverses because their sum is 0.

PRACTICE 6 problems

1 Write the opposite of -18.

ANSWER _____

2 Write the opposite of $\frac{3}{5}$.

ANSWER _____

3 Complete the equation: $-27 + \underline{\hspace{1cm}} = 0$

ANSWER _____

4 Complete the equation: $4.6 + \underline{\hspace{1cm}} = 0$

ANSWER _____

5 Are -9 and 9 additive inverses? Explain using an equation.

ANSWER _____

6 Find the sum: $-2\frac{1}{4} + 2\frac{1}{4}$

ANSWER _____

APPLY IT Show your work

- 1** In a video game, Kai earns 15 points for completing a level. Later, a penalty takes away 15 points. What is Kai's total change in points? Explain why.

WORK SPACE

ANSWER _____

- 2** A skateboarder rides 3.5 meters up a ramp from ground level, then rides 3.5 meters back down to ground level. What is the skateboarder's net vertical change?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A phone's battery level changes by -12% , then $+x\%$, then -5% . What value of x makes the overall change 0? Explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Write the opposite of -18.	18
2	Write the opposite of $\frac{3}{5}$.	$-\frac{3}{5}$
3	Complete the equation: $-27 + \underline{\hspace{1cm}} = 0$	27
4	Complete the equation: $4.6 + \underline{\hspace{1cm}} = 0$	-4.6
5	Are -9 and 9 additive inverses? Explain using an equation.	Yes. $-9 + 9 = 0$.
6	Find the sum: $-2\frac{1}{4} + 2\frac{1}{4}$	0

PART 2 • APPLY IT

- 0 points. +15 and -15 are opposites, so they add to 0.** Represent the changes as +15 and -15. Their sum is $+15 + -15 = 0$.
- 0 meters** The upward change is +3.5 meters and the downward change is -3.5 meters. Adding the opposite quantities gives 0.

CHALLENGE

$x = 17\%$, because $-12\% + -5\% = -17\%$, and the opposite of -17% is $+17\%$.

Accept equivalent explanations that state the quantities have equal absolute values and different signs. For the challenge, accept 17 or +17% when the student clearly identifies the battery increase.