

Inverse Distance Quest

Turn subtraction into addition and measure space between numbers.

GRADE 7 • 7.NR.1.4

7.NR.1.4 "Show and explain subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference and apply this principle in..."

NAME _____

DATE _____

SUBTRACT, THEN MEASURE

To subtract q , add its opposite: $p - q = p + (-q)$. The distance between two rational numbers is the positive value of their difference, so use absolute value: $|p - q|$.

WORKED EXAMPLE

Find $-2/3 - 5/6$.

1. Rewrite subtraction as addition: $-2/3 + (-5/6)$.
2. Use sixths: $-4/6 + (-5/6)$.
3. Add: $-9/6 = -3/2$.

Answer: $-3/2$

PRACTICE 6 problems

1 Rewrite as addition, then find: $7/8 - 1/4$.

ANSWER _____

2 Rewrite as addition, then find: $-3/5 - 1/10$.

ANSWER _____

3 Rewrite as addition, then find: $-1/6 - (-2/5)$.

ANSWER _____

4 Find the distance between $-7/10$ and $3/10$ on a number line.

ANSWER _____

5 Find the distance between $5/4$ and $-1/2$ on a number line.

ANSWER _____

6 Rewrite as addition, then find: $9/10 - (-3/10)$.

ANSWER _____

APPLY IT Show your work

- 1** During a coding contest, Nia has $\frac{7}{8}$ point before judges subtract $\frac{1}{3}$ point for a rule violation. What is Nia's score after the penalty?

WORK SPACE

ANSWER _____

- 2** On a climbing app's vertical map, Lio's marker is at $-1\frac{1}{5}$ meters and a teammate's marker is at $\frac{2}{5}$ meter. How far apart are the markers?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

The numbers $-\frac{7}{12}$ and $\frac{5}{8}$ are points on a number line. Find their distance. Then explain in one or two sentences why reversing the order of subtraction gives the same distance.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Rewrite as addition, then find: $7/8 - 1/4$.	$7/8 + (-1/4) = 5/8$
2	Rewrite as addition, then find: $-3/5 - 1/10$.	$-3/5 + (-1/10) = -7/10$
3	Rewrite as addition, then find: $-1/6 - (-2/5)$.	$-1/6 + 2/5 = 7/30$
4	Find the distance between $-7/10$ and $3/10$ on a number line.	1
5	Find the distance between $5/4$ and $-1/2$ on a number line.	7/4
6	Rewrite as addition, then find: $9/10 - (-3/10)$.	$9/10 + 3/10 = 6/5$

PART 2 • APPLY IT

- 13/24 point** Model the penalty as $7/8 - 1/3$, or $7/8 + (-1/3)$. Use twenty-fourths to get $21/24 + (-8/24) = 13/24$.
- 8/5 meters, or 1 3/5 meters** Find the absolute value of the difference: $|2/5 - (-1 \frac{1}{5})| = |2/5 + 6/5| = 8/5$.

CHALLENGE

The distance is 29/24 because $|5/8 - (-7/12)| = 29/24$. Reversing the subtraction gives -29/24, and its absolute value is still 29/24.

Accept equivalent fractions and mixed-number forms. For distance, accept only a positive equivalent value, and for rewrite problems, accept any correct addition-of-the-opposite expression.