LESSON MAKER PRO

Rational Number Route

Estimate, calculate, and check multistep rational-number situations.

GRADE 7 · 7.CE.1

7.CE.1 "The student will estimate, solve, and justify solutions to multistep contextual problems involving operations with rational numbers. Estimate, solve, and justify solutions to contextual problems involving addition, subtraction..."

NAME _____ DATE _____

ESTIMATE, THEN SOLVE

First make a quick estimate. Round decimals to whole numbers, and use benchmarks such as 0, 1/2, and 1 for fractions. Then solve using the order of operations and compare your exact answer with your estimate to see whether it makes sense.

WORKED EXAMPLE

Estimate and solve: -4.6 + 2.35 - (-1.2)

1. Estimate: -5 + 2 - (-1) = -2.
2. Exact: -4.6 + 2.35 = -2.25.
3. Then -2.25 - (-1.2) = -1.05.

Answer: Estimate: about -2; exact answer: -1.05

PRACTICE 6 problems

1 Estimate by rounding to the nearest whole number, then solve: -3.75 + 6.2 - 1.45

ANSWER _____

2 Use fraction benchmarks to estimate, then solve: 5/6 - (-1/4) + 2/3

ANSWER _____

3 Estimate, then solve: (-2 1/3) × 3/7 + 5/8

ANSWER _____

4 Estimate by rounding to the nearest whole number, then solve: 4.5 ÷ (-0.6) + 1.75

ANSWER _____

5 Use fraction benchmarks to estimate, then solve: -7/9 ÷ 14/27 - 1/6

ANSWER _____

6 Use compatible numbers to estimate, then solve: 1.875 - (-2.4) ÷ 0.3

ANSWER _____

APPLY IT Show your work

1 Your music app account starts at -$6.40 because you owe that amount. You earn $18.75 for helping at a school event. Then you and 3 friends split a $9.60 headphone repair bill equally. Estimate your final account balance, find the exact balance, and write one sentence explaining why your answer is reasonable.

WORK SPACE

ANSWER _____

2 A student has 4 1/2 GB of free storage for a video project. The video files use 3/4 GB, then the student deletes 1 1/4 GB of old files. The remaining free storage is split equally between 2 project folders. Estimate and find the exact amount of free storage in each folder.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A robotics team has 12 1/2 m of wire. It uses 3 pieces that are each 1 3/4 m long, then receives 1 1/4 m more wire. The team divides the wire left equally among 4 sensors. Estimate the wire for each sensor, find the exact amount, and explain why the exact answer is reasonable.

WORK SPACE AND ANSWER

ANSWER KEY

Rational Number Route

GRADE 7 · 7.CE.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Estimate by rounding to the nearest whole number, then solve: -3.75 + 6.2 - 1.45	**Estimate: 1; exact answer: 1**
2	Use fraction benchmarks to estimate, then solve: 5/6 - (-1/4) + 2/3	**Estimate: about 2; exact answer: 7/4, or 1 3/4**
3	Estimate, then solve: (-2 1/3) × 3/7 + 5/8	**Estimate: about 0; exact answer: -3/8**
4	Estimate by rounding to the nearest whole number, then solve: 4.5 ÷ (-0.6) + 1.75	**Estimate: about -3; exact answer: -5.75**
5	Use fraction benchmarks to estimate, then solve: -7/9 ÷ 14/27 - 1/6	**Estimate: about -2; exact answer: -5/3, or -1 2/3**
6	Use compatible numbers to estimate, then solve: 1.875 - (-2.4) ÷ 0.3	**Estimate: about 10; exact answer: 9.875**

PART 2 · APPLY IT

1. **Estimate: about $11; exact balance: $9.95** There are 4 people sharing the bill, so the student's share is $9.60 ÷ 4 = $2.40. Compute -$6.40 + $18.75 - $2.40 = $9.95; this is reasonably close to the estimate.
2. **Estimate: about 2 1/2 GB per folder; exact answer: 2 1/2 GB per folder** Compute 4 1/2 - 3/4 + 1 1/4 = 5 GB of free storage. Divide 5 GB by 2 folders to get 2 1/2 GB per folder.

CHALLENGE

Estimate: about 2 m per sensor; exact answer: 2 1/8 m per sensor. Since the team has a little more than 8 m left before dividing by 4, each sensor should receive a little more than 2 m.

Accept equivalent fraction, mixed-number, and decimal forms for exact answers. Estimates may vary when students use reasonable rounding or fraction benchmarks, as long as their method and comparison are sensible.