

Integer Quest

Estimate, solve, and defend each answer.

GRADE 6 • 6.CE.2.d

6.CE.2.d "Estimate, determine, and justify the solution to one and two-step contextual problems, involving addition, subtraction, multiplication, and division with integers."

NAME _____

DATE _____

PLAN, SOLVE, EXPLAIN

Estimate first by using nearby numbers that are easy to compute. Then solve exactly, following the order of operations, and use the signs and sizes of the integers to explain why your answer makes sense.

WORKED EXAMPLE

Estimate and solve: $-43 + 17 + 26$

1. Round: -43 is about -40, 17 is about 20, and 26 is about 30.
2. Estimate: $-40 + 20 + 30 = 10$.
3. Exact: $-43 + 17 = -26$.
4. Then $-26 + 26 = 0$.

Answer: Estimate: about 10. Exact answer: 0.

PRACTICE 6 problems

- 1** Estimate and solve: $-18 + 31$. Write a sentence that explains why the exact sum is positive or negative.

ANSWER _____

- 2** Estimate and solve: $42 - 57$. Write a sentence that explains why the exact difference is positive or negative.

ANSWER _____

- 3** Estimate and solve: $(-9) \times 7$. Explain the sign of the product.

ANSWER _____

- 4** Estimate and solve: $-72 \div 9$. Explain the sign of the quotient.

ANSWER _____

- 5** Estimate and solve: $-13 + 24 - 18$. Explain why the result is positive or negative.

ANSWER _____

- 6** Estimate and solve: $(-6 \times 8) + 35$. Explain why the final result is positive or negative.

ANSWER _____

APPLY IT Show your work

- 1** A player has 64 game tokens. The player spends 27 tokens on a character upgrade and then earns 15 tokens by finishing a quest. Estimate, then find the exact number of tokens. Write a sentence explaining why the answer is reasonable.

WORK SPACE

ANSWER _____

- 2** In a robotics tournament, a team earns 9 points for each of 7 completed tasks. The team then loses 14 points for a rule violation. Estimate, then find the exact score. Explain why the score is positive.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A digital game account has a balance of -\$14 because of a fee. The player adds \$9 to the account 4 times. Estimate and find the exact balance. Explain why the balance changes from negative to positive.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Estimate and solve: $-18 + 31$. Write a sentence that explains why the exact sum is positive or negative.	Estimate: about 15. Exact answer: 13. The positive integer has a greater absolute value than the negative integer, so the sum is positive.
2	Estimate and solve: $42 - 57$. Write a sentence that explains why the exact difference is positive or negative.	Estimate: about -15. Exact answer: -15. Subtracting a greater number from a smaller number gives a negative difference.
3	Estimate and solve: $(-9) \times 7$. Explain the sign of the product.	Estimate: about -70. Exact answer: -63. One factor is negative and one factor is positive, so the product is negative.
4	Estimate and solve: $-72 \div 9$. Explain the sign of the quotient.	Estimate: about -8. Exact answer: -8. A negative dividend divided by a positive divisor gives a negative quotient.
5	Estimate and solve: $-13 + 24 - 18$. Explain why the result is positive or negative.	Estimate: about -5. Exact answer: -7. The negative amounts have a total absolute value of 31, which is greater than 24, so the result is negative.
6	Estimate and solve: $(-6 \times 8) + 35$. Explain why the final result is positive or negative.	Estimate: about -15. Exact answer: -13. The negative product is -48, and its absolute value is greater than 35, so the final result is negative.

PART 2 • APPLY IT

- Estimate: about 55 tokens. Exact answer: 52 tokens.** Compute $64 - 27 + 15 = 52$. The player spends more tokens than are earned, so the final amount should be less than 64.
- Estimate: about 55 points. Exact answer: 49 points.** Compute $9 \times 7 = 63$, then $63 - 14 = 49$. The earned points are greater than the penalty, so the score remains positive.

CHALLENGE

Estimate: about \$25. Exact answer: \$22. Multiply first: $4 \times \$9 = \36 . Adding \$36 to a balance of -\$14 leaves \$22, so the added money is greater than the amount owed.

Accept reasonable nearby-number estimates that support the exact calculation. For explanations, accept equivalent wording that correctly uses operation rules, signs, or comparisons of absolute values.