Solving Real-World Problems with Rational Numbers

Explore ideas and representations

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Choose signed values before calculating. Multiply repeated changes first, then combine with the start; use units throughout. Starting at 5.5 m with three changes of -0.5 m gives $5.5 + 3(-0.5) = 4$ m. Recover a start by subtracting the total signed change from the finish.

Worked example

Evaluate $(\frac{11}{2}) + (-\frac{3}{2})$. Show an exact fraction or integer.

1. Use denominator 2: $\frac{11}{2} = 11/2$ and $-\frac{3}{2} = -3/2$.
2. Combine the signed numerators: $11 + (-3) = 8$.
3. The value is $8/2 = 4$.
Answer: 4.

Practice Problems

Show your thinking.

1. Tank level starts at 6 L and changes by $-\frac{3}{4}$ L per hour for 3 hours. Find the final reading.

2. Account balance: model 3 withdrawals of 1 dollars from $\frac{13}{2}$ dollars. Find the signed total change and balance.

3. Temperature drops $\frac{5}{4}$ degrees C each hour from 7 for 3 hours. Write and evaluate one expression.

4. Trail elevation: split a total change of $-\frac{9}{2}$ m into 3 equal stages; then apply it to $\frac{15}{2}$ m.

5. Stock mass: 3 packages each lose $\frac{7}{4}$ kg. Find total loss and mass left from 8 kg.

6. Depth reading: compute the final position after 3 changes of -2 m from $\frac{17}{2}$, then its distance from zero.

7. Freezer temperature starts at $\frac{17}{2}$ degrees C and changes $-\frac{3}{5}$ each stage for 5 stages. Find the final reading.

8. Storage balance starts at $\frac{23}{2}$ kg and changes $-\frac{7}{8}$ each stage for 4 stages. Find the final reading.

Answer Key

1. Total change $-\frac{9}{4}$ L; final $\frac{15}{4}$ L.
2. Total change -3 dollars; final $\frac{7}{2}$ dollars.
3. $7 + 3(-\frac{5}{4}) = \frac{13}{4}$ degrees C.
4. Change per stage: $-\frac{3}{2}$ m; final elevation 3 m.
5. Total change $-\frac{21}{4}$ kg; final $\frac{11}{4}$ kg.
6. Final $\frac{5}{2}$ m; distance from zero $\frac{5}{2}$ m.
7. $\frac{11}{2}$ degrees C.
8. 8 kg.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Total signed change: $(-\frac{3}{4})(3) = -\frac{9}{4}$ L.
2. Final reading: $6 + (-\frac{9}{4}) = \frac{15}{4}$ L.
3. Check backward: $\frac{15}{4} - (-\frac{9}{4}) = 6$ L.

Problem 2

1. Total signed change: $(-1)(3) = -3$ dollars.
2. Final reading: $\frac{13}{2} + (-3) = \frac{7}{2}$ dollars.
3. Check backward: $\frac{7}{2} - (-3) = \frac{13}{2}$ dollars.

Problem 3

1. Write the entire change as $7 + 3(-\frac{5}{4})$; a drop has a negative sign.
2. Multiply first: $3(-\frac{5}{4}) = -\frac{15}{4}$.
3. Add to the starting temperature: $7 + (-\frac{15}{4}) = \frac{13}{4}$ degrees C.

Problem 4

1. Split the given total into equal stages: $(-\frac{9}{2}) \div 3 = -\frac{3}{2}$ m per stage.
2. The stages combine to $3(-\frac{3}{2}) = -\frac{9}{2}$ m.
3. Apply that change: $\frac{15}{2} + (-\frac{9}{2}) = 3$ m.

Problem 5

1. Total signed change: $(-\frac{7}{4})(3) = -\frac{21}{4}$ kg.
2. Final reading: $8 + (-\frac{21}{4}) = \frac{11}{4}$ kg.
3. Check backward: $\frac{11}{4} - (-\frac{21}{4}) = 8$ kg.

Problem 6

1. Total signed change: $(-2)(3) = -6$ m.
2. Final reading: $\frac{17}{2} + (-6) = \frac{5}{2}$ m.
3. Distance from zero is $|\frac{5}{2}| = \frac{5}{2}$ m, regardless of the sign of the position.

Problem 7

1. Total change $= 5(-\frac{3}{5}) = -3$ degrees C.
2. End $= \frac{17}{2} + (-3) = \frac{11}{2}$ degrees C.
3. Check change per stage: $(\frac{11}{2} - \frac{17}{2})/5 = -\frac{3}{5}$ degrees C.

Problem 8

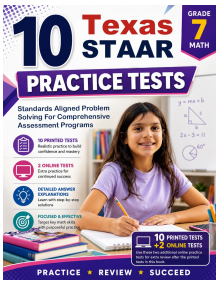
1. Total change $= 4(-\frac{7}{8}) = -\frac{7}{2}$ kg.
2. End $= \frac{23}{2} + (-\frac{7}{2}) = 8$ kg.
3. Check change per stage: $(8 - \frac{23}{2})/4 = -\frac{7}{8}$ kg.

TESTINAR

Keep Building Grade 7 Math Skills

Choose the practice book matched to your state assessment and turn worksheet practice into a complete test-prep plan.

All Grade 7 books



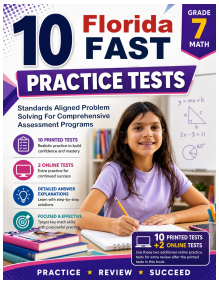
TEXAS STAAR

10 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook



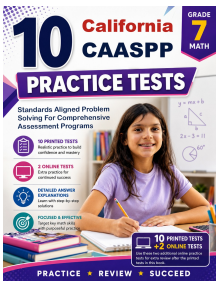
FLORIDA FAST

10 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook



CALIFORNIA CAASPP

10 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 10 printable practice tests.

Printable eBook • Instant PDF access

View eBook

Need a different state?
Testinar has Grade 7 math practice books for state assessments across the country.

TESTINAR.COM/GRADES/7