

Section 3.3 - Subtracting Rational Numbers

Here is part of a stock market report from February 5, 2008, for some Canadian companies.

Company	Stock price at the end of the day (\$)	Stock price at the start of the day (\$)
Bombardier	4.670	4.710
Canadian National Railway	50.630	51.330
Canadian Tire Corporation	64.840	65.970
Potash Corporation of Saskatchewan	144.580	144.15

For each stock:

- Determine: (price at the end of the day) – (price at the start of the day)
- What does it mean when this difference in prices is positive? Is negative?
- Sketch a number line to show each subtraction.
- Use rational numbers to write a subtraction statement.

Recall: to subtract integers we "ADD THE OPPOSITE"

Add the opposite of the 2nd #

$$\begin{aligned} \text{ie: } & (-5) - 2 \\ &= (-5) + (-2) \\ &= (-7) \end{aligned}$$

$$\begin{aligned} \text{ie: } & (-5) - (-2) \\ &= (-5) + (+2) \\ &= (-3) \end{aligned}$$

To subtract rational numbers, we add it's opposite

ie:

$$\frac{1}{3} - \frac{5}{6}$$

$$\frac{1}{3} + \frac{-5}{6} \leftarrow \text{Add the opposite}$$

$$\frac{?}{6} + \frac{-5}{6} \leftarrow \text{Find a common denominator of 3 \& 6} \quad - \quad 6$$

$$\frac{2}{6} + \frac{-5}{6} \leftarrow \text{Add only the numerators } 2 + (-5) = (-3)$$

$$= \frac{-3}{6}$$

$$\frac{-3 \div 3}{6 \div 3} = \frac{-1}{2} \leftarrow \text{Reduce to lowest terms by dividing by 3}$$

Try...

$$\frac{3}{4} - 2\frac{5}{8} \leftarrow \text{Write } 2\frac{5}{8} \text{ as an improper fraction}$$
$$\frac{2 \times 8 + 5}{8} = \frac{21}{8}$$

$$\frac{3}{4} - \frac{21}{8}$$
$$\frac{3}{4} + \frac{-21}{8}$$
$$\frac{6}{8} + \frac{-21}{8} \leftarrow \text{Common Denominator is 8}$$
$$= \frac{-15}{8} \leftarrow \text{Add Numerators}$$

OR $-1\frac{7}{8} \leftarrow \text{May write it as a mixed number}$

Try these...

1. $-2\frac{3}{8} - 3\frac{1}{2}$

2. $5\frac{3}{5} - \left(-2\frac{1}{2}\right)$

Solving a problem by subtracting rational numbers...

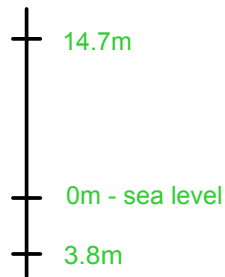
ex: In Alberta, the lowest temperature ever recorded was -61.1°C . The highest temperature was 43.3°C .

What is the difference between these temperatures?

$$\begin{aligned} &\text{Highest} - \text{Lowest} \\ &43.3 - (-61.1) \\ &104.4^{\circ}\text{C} \end{aligned}$$

ex: A diver jumps off a cliff that is 14.7m above sea level. After hitting the water, he plunges 3.8m below the surface.

a) What is the difference in heights from the top of the cliff to the bottom of his dive?



$$14.7\text{m above sea level} = +14.7 \qquad 3.8\text{m below} = (-3.8)$$

$$\begin{aligned} &\text{highest} - \text{lowest} \\ &14.7 - (-3.8) \\ &14.7 + (3.8) \\ &18.5\text{m} \end{aligned}$$

b) The water is 5.6m deep. What is the distance from the ocean floor to the bottom of the dive?

$$\begin{aligned} &\text{highest} - \text{lowest} \\ &-3.8 - (-5.6) \\ &-3.8 + 5.6 \\ &1.8\text{m distance} \end{aligned}$$

Checkpoint (Workbook) pp. 114 - 116

Text pp. 119 - 120, #'s 3 - 13

Midunit review p.121