The Number System (7.NS.A.1)

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers.

1. Which of these expressions is equal to this expression? $5\frac{3}{4} - \left(-\frac{5}{8}\right)$

   A. $5\frac{3}{4} - \left(\frac{5}{8}\right)$

   B. $5\frac{3}{4} + \left(\frac{5}{8}\right)$

   C. $5\frac{3}{4} + \left(-\frac{5}{8}\right)$

   D. $5\frac{3}{4} + \left(+\frac{5}{8}\right)$

   E. $-5\frac{3}{4} + \left(-\frac{5}{8}\right)$

   F. $-5\frac{3}{4} + \left(+\frac{5}{8}\right)$

2. In which of these situations would the answer to the question be 0?

   A. Eddie jumped into a pool from a diving board 5 feet above the water. He sank 5 feet and then swam straight to the surface of the water. How many feet with Eddie swim?

   B. Ross left his house and jogged 3 miles directly west. Then he jogged 3 miles directly east. At this point, now many miles was Ross from his house?

   C. On Monday, the low temperature was -18°. The high temperature that day was 18°. What is the different between the low and high temperatures?

3. Consider the equations $8 + x = n$.

   What must be true about any value of x if n is a negative number? Explain your answer. Include an example with numbers to support your explanation.

   8 + x = nIf n is a negative number, then x must be less than -8.

   8 + x = n   (Replace x with -9, a # < -8.)
   8 + -9 = -1   (The value of n is negative.)

4. On Monday, the temperature at 10 am at Sam's house was -6° Fahrenheit. The temperature at 2 pm at Sam's house was 2° Fahrenheit. Which statement about the temperature from 10 am to 2 pm at Sam's house is true?

   A. The temperature decreased by 12° F

   B. The temperature decreased by 4° F

   C. The temperature increased by 3° F

   D. The temperature increased by 8° F

5. Which expressions are equivalent to -5 - (2.5 + 7)? Select all that apply.

   A. (2.5 + 7) - 5

   B. -(2.5 + 7) - 5

   C. (2.5 + 7) + 5

   D. -5 - (7 + 2.5)

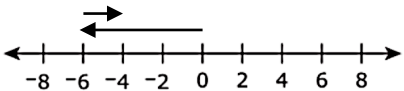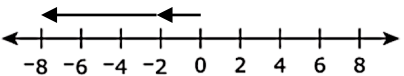   E. -(5 - 2.5) + 7

   F. -5 + (-2.5 - 7)

   G. -5 + (-2.5 + 7)

6. Which expression is equivalent to 6.4 - 6.7?

   A. 6.7 - 6.4

   B. 6.4 + 6.7

   C. 6.4 + (-6.7)

   D. 6.4 - (-6.7)

7. A meteorologist was monitoring the temperature outside in degrees Fahrenheit (°F) and wrote the expression 88 + (-10) - 7. Which statement best describes this expression?

   A. The temperature started at 88°F and increased by 10°F. Then the temperature decreased by 7°F.

   B. The temperature started at 88°F and increased by 10°F. Then the temperature increased by 7°F.

   C. The temperature started at 88°F and decreased by 10°F. Then the temperature decreased by 7°F.

   D. The temperature started at 88°F and decreased by 10°F. Then the temperature increased by 7°F.

8. For each expression in the table, select which number line model, if any, can be used to represent the expression. Select all appropriate cells in the table.

Expression	(number line model 1)	(number line model 2)	Neither number line model can be used to represent the situation.
-2 + 6			X
-6 + 2	X		
-2 - (-6)			X
-2 - 6		X	
-6 - (-2)	X		

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9. Tides are measures by the heights of the tide above or below sea level. The difference between the two heights represents how much greater the high tide is than the low tide. The table shows the high and low tides and the difference between their heights at each of three locations. Some of the data in the table are missing.

Location	High Tide	Low Tide	Difference Between High and Low Tides
P	8.53	0.63	?
Q	6.98	-0.94	7.92
R	?	-1.02	6.75

• Find the difference between high and low tides for location P. Show your work or explain your answer.

8.53 - .63 = **7.9**

• Find high tide for location R. Show your work or explain your answer.

n - (-1.02) = 6.75

n + 1.02 = 6.75

n = 5.73

• The tides are measured at a fourth location, T. The mean of the low tide values at the locations P, Q, R, and T is -0.27 foot. What is the value of the low tide at location T? Show your work or explain how you found your answer.

(0.63 - 0.94 - 1.02 + n) ÷ 4 = -0.27

(0.63 - 0.94 - 1.02 + n) = -1.08

-1.33 + n = -1.08

n = 0.25