



In these activities you will identify equivalent expressions involving rational numbers. After completing the activities, discuss and/or present your findings to the rest of the class.



Activity 1 [Page 1.3]

1. Make a conjecture about which, if any, of the following are equivalent expressions and why. Think about the order of operations, in particular subtracting a quantity, and what that means. Use the TNS activity to check your conjecture.

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

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

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

d. $\frac{5}{3}a - 2\left(2 - \frac{4}{3}a\right)$

2. Identify the following statements as true or false. Use the TNS activity to support your reasoning.
 - a. In the expression $2a + 3b$, the variables a and b must always have different values.

 - b. $2a + 3b$ is equivalent to $5ab$.



- c. $\frac{3}{4}b - \left(-\frac{1}{4}\right)b$ is equivalent to b .
- d. If a and b have the same value, then the expressions $2a$ and $3b$ will never have the same value.
3. For each of the following, find an equivalent expression of the given form where c , d , and e are rational numbers. Use the TNS activity to check your thinking.
- a. of the form $cx + d$: $\left(\frac{1}{2}\right)(x - 7) - \frac{1}{4}x$
- b. of the form $c(x + d)$: $3(x - 7) - 11(x - 7)$
- c. of the form $c + dx$: $\frac{1}{2}x - \frac{3}{4} - \frac{2}{3}x + \frac{1}{8}$
- d. of the form $c(dx + e)$: $5x - 15(x - 3)$



Activity 2 [Page 1.5]

- On page 1.5 enter the two given expressions and Submit. Generate values for the table and use them to answer the question: As a goes from 1 to 500 and beyond, which of the two expressions has the larger value? Explain why your answer makes sense in each case.
 - $200 + 20a$ and $200 + 50a$
 - $2a$ and a^2
 - $-5a - 10$ and $-10a + 10$
 - $\frac{a^2}{a^3}$ and $\frac{1}{(5a)}$
- The cost to belong Bey's music club is \$14, and you can download a song for \$2. The cost to belong to Mado's music club is \$8, and you can download a song for \$3.
 - If you downloaded 4 songs, which music club would be cheaper? Explain your thinking.
 - Let a represent the number of songs you downloaded. Write expressions for downloading " a " songs from each club. Enter the expressions on page 1.5 and Submit.
 - Use the table to determine which music club will be the least expensive.