

**Practice
5-5****Operations With Rational Numbers**

1. a) Simplify the expression $-8\left(-\frac{3}{4} + 6\right)$ by applying the Distributive Property.

b) Evaluate the expression $-8\left(-\frac{3}{4} + 6\right)$.

2. a) Apply the Distributive Property to simplify the expression $-8(-2.5 - 7)$.

b) Evaluate the expression $-8(-2.5 - 7)$.

3. Simplify the expression $4.5(-6) + 19$.

4. Use the formula $F = \frac{9}{5}C + 32$ to convert -20°C to degrees Fahrenheit.

5. Simplify the complex fraction $\frac{-\frac{1}{4}}{-12}$.

6. The water level of a lake fell by $1\frac{1}{2}$ in. during a $1\frac{2}{3}$ -week-long dry spell.

Simplify the complex fraction $\frac{-1\frac{1}{2}}{1\frac{2}{3}}$ to find the average rate at which the

water level changed every week.

7. a) **Writing** Simplify the complex fraction $\frac{\frac{3}{4}}{2\frac{1}{4}}$.

- b) Explain why, when dividing fractions with the same denominator, you can find the quotient by dividing the numerators. Use the complex fraction as an example.

8. Reasoning

A. $-4\left(-1\frac{1}{2}-9\right)$

B. $-4\left(\left(-1-\frac{1}{2}\right)-9\right)$

- a) Use the Distributive Property to rewrite expression A. Which expression is correct?

A. $-4\left(-1\frac{1}{2}\right)-(-4)(9)$

B. $-4\left(-1\frac{1}{2}\right)-4(9)$

C. $-4\left(-1\frac{1}{2}\right)-9$

- b) Evaluate expression A.

- c) Use the Distributive Property to rewrite expression B. Which expression is correct?

A. $-4(-1)-(-4)\left(\frac{1}{2}\right)-(-4)(9)$

B. $-4(-1)-(-4)\left(-\frac{1}{2}\right)-(-4)(-9)$

C. $-4(-1)+(-4)\left(\frac{1}{2}\right)-(-4)(9)$

- d) Evaluate expression B.

- e) Copy expressions A and B. Circle the parts in the two expressions that are different. How do the expressions inside your circles compare? Explain your reasoning.

9. **Error Analysis** In evaluating the expression $\frac{9}{4}(-20) + 18$, Jenny found the value to be 63. She thinks that the number is too great, but is not sure what she did wrong.

a) Evaluate the expression.

b) What was Jenny's likely error?

- A. She multiplied $\frac{9}{4}$ by 20 instead of -20 .
- B. She multiplied -20 by $\frac{4}{9}$ instead of $\frac{9}{4}$.
- C. She subtracted 18 instead of adding.
- D. She divided $\frac{9}{4}$ by -20 instead of multiplying.

10. **Home Heating Repair** Stewart's home is heated by hot water circulating in pipes. Recently, the system developed a small leak. It loses $1\frac{3}{5}$ milliliters every 10 minutes. Use the complex fraction $\frac{-1\frac{3}{5} \text{ milliliters}}{10 \text{ minutes}}$ to find the change of the amount of water in the system per minute.

11. a) **Open-Ended** Use the Distributive Property to simplify the expression

$-8\left(-2\frac{1}{2} + 3\right)$. Which expression is correct?

- A. $-8\left(-2\frac{1}{2}\right) + 3$
- B. $-8\left(-2\frac{1}{2}\right) + (-8)(3)$
- C. $-8\left(-2\frac{1}{2}\right) + 8(3)$

b) Evaluate the expression.

c) Give an example of how to use the Distributive Property $a(b - c) = ab - ac$ to simplify an expression with $a < 0$ and $b < 0$. Choose values for a , b , and c .

12. What is the value of $-\frac{1}{6}x + 21$ when $x = -60$?

13. Mental Math

a) Evaluate $-2\left(-\frac{1}{2} - 1\right)$ by applying the Distributive Property.

b) Explain how you can use mental math to find the value.

14. **Think About the Process** Robin works as a customer service representative. She knows that the amount in dollars of her yearly bonus is represented by the expression $-3.5x + 172$, where x is the number of complaints customers had about her during the year. To find her bonus if she gets 12 complaints, she substitutes 12 for x .

a) What should be her next step?

- A. Multiply -3.5 by 12.
- B. Add 12 and 172.
- C. Use the Distributive Property.

b) What would her bonus be?