Name _____   Date_____

Writing, Evaluating, and Finding Equivalent

Expressions with Rational Numbers

Bradley and Louie are roommates at college. At the beginning of the semester, they each paid a security deposit of A dollars. When they move out, their landlord will deduct from this deposit any expenses (B) for excessive wear and tear and refund the remaining amount. Bradley and Louie will share the expenses equally.

- Write an expression that describes the amount each roommate will receive from the landlord when the lease expires.
- Evaluate the expression using the following information: Each roommate paid a $125 deposit, and the landlord deducted $50 total for damages.

1. Sally is paid a fixed amount of money to walk her neighbor's dog every day after school. When she is paid each month, she puts aside $20 to spend and saves the remaining amount. Write an expression that represents the amount Sally will save in 6 months if she earns m dollars each month. If Sally is paid $65 each month, how much will she save in 6 months?

2. A football team scored 3 touchdowns, 3 extra points, and 4 field goals.

    a. Write an expression to represent the total points the football team scored.

    b. Write another expression that is equivalent to the one written above.

    c. If each touchdown is worth 6 points, each extra point is 1 point, and each field goal is 3 points, how many total points did the team score?

3. Write three other expressions that are equivalent to $8x - 12$.

4. Profit is defined as earnings less expenses (earnings – expenses). At the local hot air balloon festival, the Ma & Pops Ice Cream Truck sells ice cream pops, which cost them $0.75 each, but are sold for $2 each. They also paid $50 to the festival's organizers for a vendor permit. The table below shows the earnings, expenses, and profit earned when 50, 75, and 100 ice cream pops were sold at the festival.

Number of Pops Sold	Earnings	Expenses	Profit
50	$50(2) = 100$	$50(0.75) + 50$ $37.5 + 50 = 87.5$	$100 - 87.5 = 12.50$
75	$75(2) = 150$	$75(0.75) + 50$ $56.25 + 50 = 106.25$	$150 - 106.25 = 43.75$
100	$100(2) = 200$	$100(0.75) + 50$ $75 + 50 = 125$	$200 - 125 = 75$

a.   Write an expression that represents the profit (in dollars) Ma & Pop earned by selling ice cream pops at the festival.

b.   Write an equivalent expression.

c.   How much did Ma & Pops Ice Cream Truck profit if it sold 20 ice cream pops? What does this mean? Explain why this might be the case?

d.   How much did Ma & Pops Ice Cream truck profit if it sold 75 Ice Cream Pops? What does this mean? Explain why this might be the case?

Bradley and Louie are roommates at college. At the beginning of the semester, they each paid a security deposit of A dollars. When they move out, their landlord will deduct from this deposit any expenses (B) for excessive wear and tear, and refund the remaining amount.

- Write an expression that describes the amount each roommate will receive from the landlord when the lease expires.

- Evaluate the expression using the following information: Each roommate paid a $125 deposit and the landlord deducted $50 total for damages.

Deposit each person paid: A

Total damages: B

Each roommate receives: $A - \dfrac{B}{2}$

$A = 125, B = 50$

$$A - \dfrac{B}{2}$$

$$125 - \dfrac{50}{2}$$

$$125 - 25$$

$$100$$

---

1. Sally is paid a fixed amount of money to walk her neighbor's dog every day after school. When she is paid each month, she puts aside $20 to spend and saves the remaining amount. Write an expression that represents the amount Sally will save in 6 months if she earns m dollars each month. If Sally is paid $65 each month, how much will she save in 6 months?

$m = monthly\ pay$

$6(m - 20)$

$6m - 120$

For $m = 65$

$6(m - 20)$	*or*	$6(m - 20)$
$6(65 - 20)$		$6(65 - 20)$
$6(45)$		$390 - 120$
$270		$270

2. A football team scored 3 touchdowns, 3 extra points, and 4 field goals.

   a. Write an expression to represent the total points the football team scored.

   $t = number\ of\ points\ for\ a\ touchdown$

   $e = number\ of\ points\ for\ the\ extra\ point$

   $f = number\ of\ points\ for\ a\ field\ goal.$

   $3t + 3e + 4f$

b. Write another expression that is equivalent to the one written above.

Answers may vary. Sample response: $3t + 3e + 2f + 2f$

c. If each touchdown is worth 6 points, each extra point is 1 point, and each field goal is 3 points, how many total points did the team score?

$3t + 3e + 4f$

$3(6) + 3(1) + 4(3)$

$18 + 3 + 12$

33

3. Write three other expressions that are equivalent to $8x - 12$.

Answers may vary.

$4(2x - 3)$

$6x + 2x - 12$

$8(x - 1) - 4$

$-12 + 8x$

4. Profit is defined as earnings less expenses (earnings – expenses). At the local hot-air balloon festival, the Ma & Pops Ice Cream Truck sells ice cream pops, which cost them 0.75 each, but are sold for \$2 each. They also paid \$50 to the festival's organizers for a vendor permit. The table below shows the earnings, expenses, and profit earned when 50, 75, and 100 ice cream pops were sold at the festival.

Number of Pops Sold	Earnings	Expenses	Profit
50	$50(2) = 100$	$50(0.75) + 50$ $37.5 + 50 = 87.5$	$100 - 87.5 = 12.50$
75	$75(2) = 150$	$75(0.75) + 50$ $56.25 + 50 = 106.25$	$150 - 106.25 = 43.75$
100	$100(2) = 200$	$100(0.75) + 50$ $75 + 50 = 125$	$200 - 125 = 75$

a. Write an expression that represents the profit (in dollars) Ma & Pop earned by selling ice cream pops at the festival.

p represents the number of pops sold

$2p - 0.75p - 50$

b. Write an equivalent expression.

$1.25p - 50$

c. How much did Ma & Pops Ice Cream Truck profit if it sold 20 ice cream pops? What does this mean? Explain why this might be the case?

$1.25p - 50$

$1.25(20) - 50$

$25 - 50$

-25

They did not make any money; they lost $25. A possible reason is it could have been cold or rainy and people were not buying ice cream.

d. How much did Ma & Pops Ice Cream truck profit if it sold 75 Ice Cream Pops? What does this mean? Explain why this might be the case?

$1.25p - 50$

$1.25(75) - 50$

$93.75 - 50$

43.75

They made a profit of $43.75. Possible reasons are the weather could have been warmer and people bought the ice cream, or people just like to eat ice cream no matter what the weather is.