

Name: _____

Date: _____

Lesson 7.5 Real-World Problems: Algebraic Expressions

Solve. Show your work.

1. Daniel's house is located b miles from his school. The swimming pool is 3 miles farther from his school. His doctor's office is 4 miles less than twice the distance from home to Daniel's school.
 - a) Write an expression that shows the distance from Daniel's house to the swimming pool.

 - b) Write an expression that shows the distance from Daniel's house to his doctor's office.

 - c) If $b = 3$, is the swimming pool or the doctor's office closer to Daniel's house? How much closer?

2. Casey can knit $6m$ doll dresses in 2 hours.
 - a) Write an expression that shows the number of doll dresses Casey can knit in 5 hours in terms of m .

 - b) If $m = 7$, how many doll dresses can Casey knit in 5 hours?

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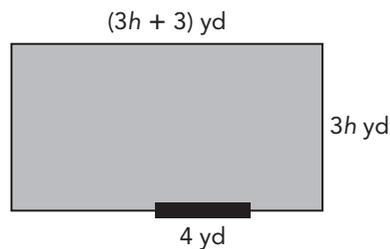
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- 3.** At a soccer tournament there are $(16x + 30)$ boys and $(5x - 12)$ more girls than boys.
- a)** How many children are there at the tournament in terms of x ?
- b)** If $x = 5$, how many girls are at the tournament?
- 4.** Adam sold $16p$ newspapers in the morning. He sold $\frac{3}{4}$ as many newspapers in the afternoon as he did in the morning. He sold 20 more newspapers in the evening than in the afternoon.
- a)** How many newspapers did Adam sell altogether in terms of p ?
- b)** If $p = 3$, how many newspapers did Adam sell altogether?
- 5.** Alicia, Jamar, and Tia collect dimes for charity. Alicia collects $(3k + 4)$ dimes. Jamar collects twice as many dimes as Alicia. Tia collects $4(5 + 6k)$ dimes. How many dimes do they collect altogether in terms of k ?

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6. The width of a rectangular field is $3h$ yards and its length is 3 yards longer than the width. The field has a fence around its perimeter with a gate 4 yards wide, as shown below.



- a) Write an expression for the perimeter of the rectangular field in terms of h , excluding the width of the gate.
- b) It costs \$28 per yard to fence the field, excluding the gate. Write an expression that represents the cost of fencing the field.
- c) If $h = 5$, find the cost of the fencing, excluding the gate.
7. Moesha is $(3g + 1)$ years old and Shanti is twice Moesha's age.
- a) Find the sum of the ages of Moesha and Shanti in 2 years' time.
- b) How old will Shanti be when Moesha's age is twice her present age?
- c) Find how old Moesha and Shanti were 4 years ago if $g = 5$.

21. $6(3p + 1)$ or $6(1 + 3p)$
 22. $2(7 + 3x)$ or $2(3x + 7)$
 23. $7(3h + 4)$
 24. $3(6k + 5)$
 25. $3y - 9 + 10 + 6y + 48y - 120 + 30 - 6y$
 $= 51y - 89$
 26. Both expressions are equal to $15w + 54$.
 Yes, the two expressions are equivalent.
 27. a) $3(5x - 8)$ miles
 b) $3(5 \cdot 15 - 8) = 201$
 The train travels 201 miles.
 28. a) Total amount = $2(3w + 8) + 3(4w - 3)$
 $= (18w + 7)$ dollars
 b) $18 \cdot 4 + 7 = 79$
 Mrs. Young paid \$79.
 29. $4(15h - 3) = 60h - 12$
 $(60h - 12) + (10h + 46) + (14h - 16)$
 $= 84h + 18$
 $(84h + 18) \div 6 = 14h + 3$
 $14 \cdot 9 + 3 = 129$
 129 centimeters
 30. a) $6(2d - 3) = (12d - 18)$ centimeters
 b) $8(2d - 3) = (16d - 24)$ centimeters
 c) Difference: $2(2d - 3)$
 $2(2 \cdot 8 - 3) = 26$ centimeters

Lesson 7.5

1. a) $(b + 3)$ miles
 b) $(2b - 4)$ miles
 c) The doctor's office is closer.
 It is 2 miles closer.
 2. a) 1 hour $\rightarrow 6m \div 2 = 3m$
 5 hours $\rightarrow 5 \times 3m = 15m$
 Casey can knit 15m doll dresses
 in 5 hours.
 b) $15 \cdot 7 = 105$
 Casey can knit 105 doll dresses
 in 5 hours.
 3. a) Number of girls: $(16x + 30) + (5x - 12)$
 $= (21x + 18)$
 Total = $(16x + 30) + (21x + 18)$
 $= (37x + 48)$
 There are $(37x + 48)$ children at the
 tournament.
 b) Number of girls: $(21x + 18)$
 $21 \cdot 5 + 18 = 123$ girls
 4. a) Afternoon: $\frac{3}{4} \cdot 16p = 12p$
 Evening: $12p + 20$
 Total = $16p + 12p + (12p + 20)$
 $= 40p + 20$
 Adam sold $(40p + 20)$ newspapers
 altogether.
 b) $40 \cdot 3 + 20 = 140$ newspapers

5. $(3k + 4) + 2(3k + 4) + 4(5 + 6k)$
 $= 33k + 32$
 They collect $(33k + 32)$ dimes altogether.
 6. a) $(12h + 2)$ yards
 b) The cost is $28(12h + 2)$ dollars.
 c) $28(12 \cdot 5 + 2) = 1,736$
 The cost is \$1,736.
 7. a) $(3g + 1) + 2(3g + 1) + 2 + 2$
 $= 9g + 7$
 The sum of their ages is $(9g + 7)$ years.
 b) $2(3g + 1) + (3g + 1)$
 $= 9g + 3$
 Shanti will be $(9g + 3)$ years old.
 c) Moesha's age: $3g + 1 - 4$
 $= 3 \cdot 5 + 1 - 4 = 12$ years
 Shanti's age: $2(3g + 1) - 4$
 $= 2 \cdot 16 - 4 = 28$ years

Brain @ Work

1. a) $\frac{1}{w}$ of the pool
 b) $\frac{1}{w+6}$ of the pool
 c) $4\left(\frac{1}{w} + \frac{1}{w+6}\right)$ of the pool
 2. a) $\frac{1}{3y+2}$ of the house
 b) $2\left(\frac{1}{3y+2+5}\right) = \frac{2}{3y+7}$ of the house
 c) $3\left(\frac{1}{3y+2} + \frac{1}{3y+7}\right)$ of the house

Cumulative Practice for Chapters 4 to 7+++

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|--|-----------------------|
| 1. 135 | 2. 6 |
| 3. 2 : 5 | 4. 8 : 13 |
| 5. 5 : 3 | 6. 4 : 3 |
| 7. 76% | 8. 109% |
| 9. 65% | 10. $58\frac{1}{3}\%$ |
| 11. 0.09 | 12. 1.5 |
| 13. $\frac{22}{25}$ | 14. $\frac{1}{5}$ |
| 15. 43.2 quarts | 16. 36 minutes |
| 17. 25 | 18. 18 |
| 19. 49 | 20. 15 |
| 21. $7w + 5$ | 22. $9 + 5y$ |
| 23. $24q - 12$ | 24. $38 + 52y$ |
| 25. $4(4g + 1)$ | 26. $7(7 - 2h)$ |
| 27. $6p + 7$ | |
| 28. 8 notebooks $\rightarrow y$ dollars
2 notebooks $\rightarrow \frac{y}{4}$ dollars | |
| 29. Nails $\rightarrow m + 20$
Bolts $\rightarrow 2m + 30$
Total $\rightarrow 3m + 50$ nails and bolts | |