Name: Answer Key Date: _____

Chapter 6 Test Study Guide

◊ 6-1: Powers and Exponents

1) Write $12 \cdot 12 \cdot 12 \cdot 12 \cdot 12$ in exponential form (using exponents!) 12^5

2) Write 5^8 as a product of the same factor. $5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5 \cdot 5$

Evaluate.

3) $(\frac{3}{4})^3 = \frac{27}{64}$ $\frac{3^3}{4^3} = \frac{3 \cdot 3 \cdot 3}{4 \cdot 4 \cdot 4}$

4) $16^1 =$ 16

5) $13^0 =$ 1

6) $1.8^2 =$ 3.24 1.8×1.8

7) Order the following powers from **least** to **greatest**: $5^3,\ 3^4,\ 11^2,\ 90^1$

$5^3 = 125$
$3^4 = 81$
$11^2 = 121$
$90^1 = 90$

$3^4, 90^1, 11^2, 5^3$

◊ 6-2: Order of Operations

Evaluate the expression using the order of operations.

8) $6^2 - 4 \div 2 + 15$

$36 - 4 \div 2 + 15$
$36 - 2 + 15$
$34 + 15$
49

9) $10 + 6 \times 12 \div (15 - 13)^3$

$10 + 6 \times 12 \div 2^3$
$10 + 6 \times 12 \div 8$
$10 + 72 \div 8$
$10 + 9$
19

◊ *6-3: Algebra: Variables and Expressions*

Evaluate each expression if $x = 2$, $y = \frac{3}{5}$, and $z = 5$?

1) $3z + 4$

$3(5) + 4$

$15 + 4$

19

2) $15xy + 2z$

$15(2)\left(\frac{3}{5}\right) + 2(5)$

$30\left(\frac{3}{5}\right) + 2(5)$

$18 + 10$

28

3) $5y^2 + x$

$5\left(\frac{3}{5}\right)^2 + 2$

$\frac{1}{\cancel{5}}\left(\frac{9}{\cancel{25}_{5}}\right) + 2$

$\frac{9}{5} = 1\frac{4}{5}$

$1\frac{4}{5} + 2 = 3\frac{4}{5}$

4) What is the value of $a + b - c$ if $a = 20$, $b = 10$, and $c = 5\frac{1}{2}$?

$20 + 10 - 5\frac{1}{2}$

$30 - 5\frac{1}{2} = 24\frac{1}{2}$

$29\ \frac{2}{2}$

$\cancel{30}$

$-\ 5\frac{1}{2}$

5) The formula $V = lwh$ is used to find the volume of a rectangular prism. Find the volume of a rectangular box with a length of 2 feet, and width of $1\frac{1}{2}$ feet, and a height of $\frac{3}{4}$ feet. Write your answer in cubic feet.

$V = \frac{\cancel{2}^{1}}{1} \cdot \frac{3}{\cancel{2}_{1}} \cdot \frac{3}{4} = \frac{9}{4} = 2\frac{1}{4}\ ft^3$

15) Ambu has saved \$56 of her allowance money to buy books. If she buys 6 books at d dollars per book, she will have $56 - 6d$ of her allowance left. How much does she have left if the books cost \$4.75 each?

$56 - 6(4.75)$

$56 - 28.50 = \$27.50$

$4.75 \times 6 = 28.50$

$\cancel{56}^{5}.{}^{10}\cancel{0} - 28.50 = 27.50$

◊ *6-4: Algebra: Writing Algebraic Expressions*

Which is the correct algebraic expression for each phrase? Circle your answer.

7) 14 more pickles than the first jar
A) $p + 14$ **B)** $14 - p$ **C)** $14p$ **D)** $14 \div p$

8) 7 inches shorter than Sue
A) $s - 7$ **B)** $7 + s$ **C)** $7 - s$ **D)** $s \div 7$

9) 3.1 times as many meters
A) $m + 3.1$ **B)** $3.1 + m$ **C)** $3.1 \div m$ **D)** $3.1m$

10) one fourth the number of rocks Joyce found
A) $4j$ **B)** $j \div 4$ **C)** $4 \div j$ **D)** $j - 4$

11) Hamza made 6 calls in one day. Each call cost the same amount of money. The next day he made a call that cost $4. Which expression represents the total cost of the calls Hamza made during the two days?

A) $6 + 4c$ **B)** $6c + 4$ **C)** $4c + 6c$ **D)** $6 + 4 + c$

Write each phrase as an algebraic expression.

12) three pretzels more than twice the number of pretzels: $2p + 3$

13) eight centimeters less than three times the height: $3h - 8$

14) Chris divided his grapes evenly among himself and four friends. Define a variable and write an expression to represent the number of grapes each person received. Then find the number of grapes each person would receive if Chris had 60 grapes.

Let g **represent** the number of grapes that Chris has

Algebraic expression: $\frac{g}{5}$ or $g \div 5$

Grapes for each person = $60 \div 5 = 12$ grapes

24) Moesha's music library has 17 more than two times the number of songs than Damian's music library. Define a variable and write an expression to represent the number of songs in Moesha's music library. Then find the number of songs in Moesha's library if Damian has 5 songs in his library.

Let s represent the number of songs in Damian's music library; $2s + 17$; $2(5) + 17 = 27$ songs

◊ 6-5: Properties of Operations

17) Which property is illustrated by the statement $8 + 2 = 2 + 8$?

A) Associative **B)** Distributive **C)** Commutative **D)** Identity

18) Which property is illustrated by the statement $3 \cdot 1 = 3$?

A) Associative **B)** Distributive **C)** Commutative **D)** Identity

19) Which property is illustrated by the statement $4 + (9 + 12) = (4 + 9) + 12$?

A) Associative **B)** Identity **C)** Distributive **D)** Commutative

Determine whether the two expressions are equivalent. If so, tell what property is applied. If not, explain why.

21) $8 + 1.2 = 1.2 + 8$

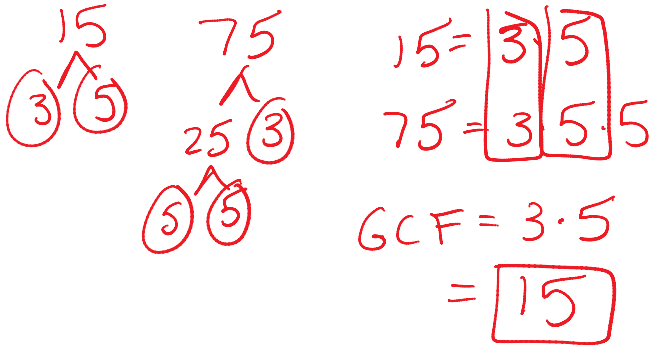
Yes they are equivalent by the commutative property of addition.

31) $48 \div (8 \div 4) = (48 \div 8) \div 4$

No they are not equivalent because the associative property does not hold true for division.

◊ 1-1: Greatest Common Factor and Least Common Multiple

30) Find the greatest common factor of 15 and 75.



15: 1, 3, 5, 15
75: 1, 3, 5, 15, 25, 75

GCF = 15

31) Find the least common multiple of 22 and 33.

22: 22, 44, 66, 88, 110
33: 33, 66, 99, 132, 165

LCM = 66

32) Big Gold Middle School has several interesting traditions. Every 7 years, they host an alumni reunion for all of its former students. Every 6 years, the current students attend a school field trip to Sandy Hook. Every 14 years, the principal plants a small oak tree on school property. If all three of these events will happen this year (2018), what year will all three events happen on the same year again?

6: 6, 12, 18, 24, 30, 36, 42

7: 7, 14, 21, 28, 35, 42, 49

14: 14, 28, 42, 56, 70

LCM = 42 years

2018 + 42

= 2060

◊ *6-6: The Distributive Property*

31) Which shows how to find 9×305 mentally by using the Distributive Property?

F. $9(300)+(5)$ **H.** $5(300+9)$ **G.** $9(300)+5(5)$ **I.** $9(300)+9(5)$

Find each product mentally. Show the steps you used.

34) 9×34

$9(30+4)$

$9(30)+9(4)$

$270 + 36$

306

35) 4×8.2

$4(8)+4(0.2)$

$32 + 0.8$

32.8

36) $15 \times 2\frac{3}{5}$

$15\left(2+\frac{3}{5}\right)$

$15(2)+15\left(\frac{3}{5}\right)$

$30 + 9$

39

Use the Distributive Property to rewrite each algebraic expression.

28) $3(y+10)$

$3y + 3(10)$

$3y + 30$

29) $3(w+1.6)$

$3w + 3(1.6)$

$3w + 4.8$

43) Five friends each spent \$9 on bowling games and \$3.50 on shoe rentals. Which expression cannot be used to find the total amount the friends spent?

A. 5(\$9) + 5(\$3.50) **C.** 5(\$9 + \$3.50) **B.** 5(\$12.50) **D.** 5(\$9)

Factor each expression.

40) 63 + 81

$63 = 3 \cdot 3 \cdot 7$

$81 = 3 \cdot 3 \cdot 3 \cdot 3$

GCF = 9

$\frac{63}{9} = 7 \quad \frac{81}{9} = 9$

$9(7+9)$

41) 18 + 36

$18 = 2 \cdot 3 \cdot 3$

$36 = 2 \cdot 2 \cdot 3 \cdot 3$

GCF = $2 \cdot 3 \cdot 3 = 18$

$\frac{18}{18} = 1 \quad \frac{36}{18} = 2$

$18(1+2)$

42) $77x + 56$

$77 = 7 \cdot 11$

$56 = 7 \cdot 2 \cdot 2 \cdot 2$

GCF = 7

$\frac{77x}{7} = 11x \quad \frac{56}{7} = 8$

$7(11x+8)$

43) $32 + 16x$

$16 = 2 \cdot 2 \cdot 2 \cdot 2$

$32 = 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

GCF = $2 \cdot 2 \cdot 2 \cdot 2 = 16$

$\frac{32}{16} = 2 \quad \frac{16x}{16} = 1x$

$16(2+x)$

◊ *6-7: Equivalent Expressions*

Simplify each expression.

37) $4x + 8x + 6x$

$18x$

38) $12y + 5x + 8y - 3x$

$2x + 20y$

39) $9(5x)$

$45x$

40) $3(7x + 2y + 4)$

$3(7x) + 3(2y) + 3(4)$

$21x + 6y + 12$

48) Five friends went to a baseball game. Three of the friends each bought a ticket for x dollars and a soda for $6.00. The other two friends each bought only tickets. Write and simplify an expression that represents the amount of money spent.

$3(x+6)+2x = 3x+18+2x = 5x+18$

Identify the terms, like terms, coefficients, and constants in each expression.

32. $4y + 5 + 3y$

Terms: $4y, 5, 3y$	
Like Terms: $4y$ & $3y$	
Coefficients: $4, 3$	
Constants: 5	

33. $2x + 3y + x + 7$

	Terms: $2x, 3y, x, 7$
	Like Terms: $2x$ & x
	Coefficients: $2, 3, 1$
	Constants: 7