

Unit 3 Study Guide: Expressions (Chapter 5 in Textbook)

Name: Key

Period: _____

Due Date: _____

Standard

EE.1: Write and evaluate expressions with exponents.

Problems

Evaluate the following expressions:

1. $20 - 36 \div 3^2 \cdot 2$

$$20 - 36 \div 9 \cdot 2$$

$$20 - 4 \cdot 2$$

$$20 - 8$$

$$= 12$$

2. $10 - 3 \times 2 + 8 \div (3 - 1)^2$

$$10 - 3 \times 2 + 8 \div 2^2$$

$$10 - 3 \times 2 + 8 \div 4$$

$$10 - 6 + 2$$

$$4 + 2$$

$$= 6$$

3. Lex evaluated the following expression. His work is shown:

$$4 + (16 \div 4) \cdot 2^3$$

$$20 \div 4 \cdot 2^3$$

$$5 \cdot 2^3$$

$$5 \cdot 8$$

$$= 40$$

$$4 + (16 \div 4) \cdot 2^3$$

$$4 + 4 \cdot 2^3$$

$$4 + 4 \cdot 8$$

$$4 + 32$$

$$= 36$$

Do you agree with his answer?

No

What mistakes were made, if any?

Lex solved from left to right instead of following order of operations

4. Evaluate $(\frac{1}{2})^3$

$$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \left(\frac{1}{8}\right)$$

5. Evaluate 7^3 :

$$7 \times 7 \times 7$$

$$\sqrt{49} \times 7$$

$$= 343$$

6. Evaluate 3^4 :

$$3 \times 3 \times 3 \times 3$$

$$= 81$$

7. Write $4 \times 4 \times 4 \times 4$ as an exponent.

$$= 4^4$$

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2a: Write expressions with numbers and variables (translating word phrases into algebraic expressions)

Write an algebraic expression for:

1. six less than some number:

$x - 6$

2. twice the sum of a number and 5:

$2(x + 5)$

3. fifteen less m:

$m - 15$

4. three times a number:

$3f$

5. twice a number:

$2w$

6. h divided by twelve:

$h \div 12$

2b: Identify parts of an expression using mathematical terms.

Term: Each part of an algebraic expression separated by a plus or minus sign

Constant: A term without a variable; a number without a variable (ex. 3)

Coefficient: The numerical factor being multiplied by a variable (ex. $3x$)

Variable: a mystery number represented by a letter.

Identify the parts of the following expressions:

$2m^3 + 4c - 5$

Variables: m, c

Terms: $2m^3, 4c, 5$

Coefficients: $2, 4$

Constants: 5

$10x + 16 - 5x^2$

Variables: x, x^2

Terms: $10x, 16, 5x^2$

Coefficients: $10, 5$

Constants: 16

Complete the table below:

Expression	Number of Terms	List the Constants, or write None	List the Coefficients, or write None	List the Variables, or write None
$5x + 2$	2	2	5	x
$11y + 3x$	2	none	11, 3	y, x
$b^2 + 5b - 1$	3	1	1, 5	b^2, b
$x^2 + 3y + 4x$	3	none	1, 3, 4	x^2, y, x
$9g + f + 8$	3	8	9, 1	g, f

2c: Evaluate expressions at specific values for their variables.

1. Evaluate $3x^2 - (x + 1)$ when $x=2$.

$$3 \cdot 2^2 - (2+1) \rightarrow 12-3$$
$$3 \cdot 2^2 - 3 = 9$$
$$3 \cdot 4 - 3 = 9$$

2. There are 3 times as many oranges as apples in a fruit bowl. If a represents the number of apples, how many oranges are there when $a=5$? Use the expression $3a$

$$\text{Oranges} = 3a$$
$$\text{Oranges} = 15$$

3. Evaluate $x^2 + 5x - 1$ when:

$$x=2: \underline{2^2 + 5 \cdot 2 - 1} \quad 4 + 10 - 1 = 13$$

$$x=4: \underline{4^2 + 5 \cdot 4 - 1} \quad 16 + 20 - 1 = 35$$

4. Evaluate $5(n-2)$ when:

$$n=3: \underline{5(3-2)} = 5$$

$$n=5: \underline{5(5-2)} = 15$$

$$n=10: \underline{5(10-2)} = 40$$

5. Evaluate $k + (5 \cdot 4)$ when:

$$k=5: \underline{5 + (5 \cdot 4)} \quad 5 + 20 = 25$$

$$k=8: \underline{8 + (5 \cdot 4)} \quad 8 + 20 = 28$$

$$k=12: \underline{12 + (5 \cdot 4)} \quad 12 + 20 = 32$$

6. Evaluate $n \cdot (3^2 - n^2) - 1$ when $n=2$:

$$2 \cdot (3^2 - 2^2) - 1$$

$$2 \cdot (9 - 4) - 1$$

$$2 \cdot 5 - 1$$

$$10 - 1$$

$$= 9$$

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