المدرسة الوطنية الأرثوذكسية الشميساني

The National Orthodox School Shmaisani

Subject: Mathematics **Second Semester**

Name: Grade 6 (B, C, D, E, F)

Unit 2: Expressions. **Worksheet (1)**

Expressions.

When we combine numbers and variables in a valid way, using operations such as addition, subtraction, multiplication and division the resulting combination of mathematical symbols is called a *mathematical expression*.

Translating Words into Mathematical Expressions

Addition:

Phrase	Translates to:
sum of x and 12	$x + 12$
4 greater than b	$b + 4$
6 more than y	$y + 6$
44 plus r	$44 + r$
3 larger than z	$z + 3$

Subtraction:

Phrase	Translates to:
difference of x and 12	$x - 12$
4 less than b	$b - 4$
7 subtracted from y	$y - 7$
44 minus r	$44 - r$
3 smaller than z	$z - 3$

Multiplying:

Phrase	Translates to:
product of x and 12	$12x$
4 times b	$4b$
twice r	$2r$

Dividing:

Phrase	Translates to:
quotient of x and 12	$x/12$
4 divided by b	$4/b$

Exercises (1):

Answer the following questions.

a) Write an expression for the total cost of k pens at \$3 per pen and p pencils at \$1 per pencil.

$3k + p$

b) Write an expression for the cost of hiring a taxi to travel K kilometers if there is a fixed cost of \$2 plus \$0.5 per kilometer.

$2 + 0.5K$

c) x chocolates are shared equally between 5 people.

Write an expression for the number of chocolates that each person receives.

$x \div 5$

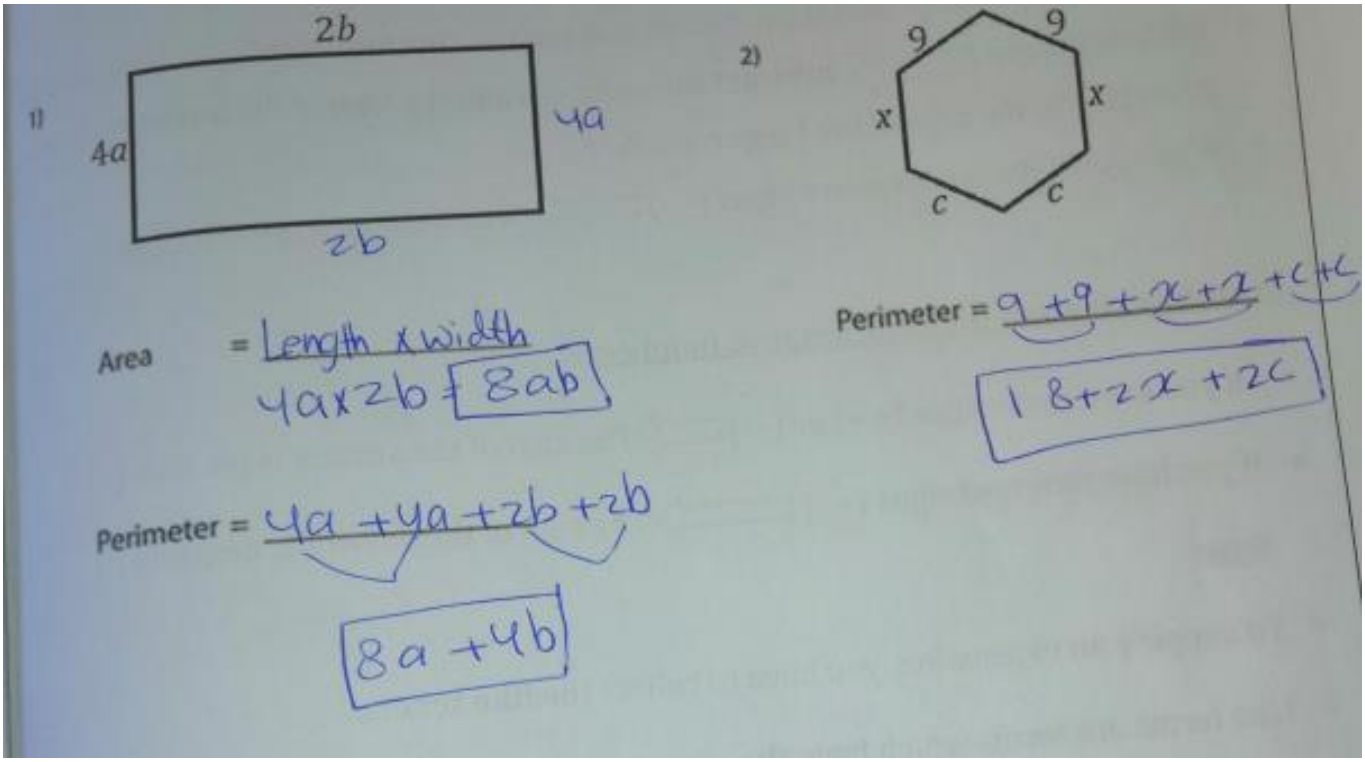
d) Carla buys a book costing \$$b$. She pays with a \$20 note.

Write an expression for the amount of change that she receives in dollars.

$20 - b$

Exercises (2):

Write an expression for the following shapes.



Simplifying algebraic expressions.

Please remember:

In **adding** and **subtracting** negative numbers:

- **Same** signs ⟹ **add** the numbers and put the **common** sign.
- **Different** signs ⟹ **subtract** the numbers and the **sign** of the **answer** according to the **sign** of the **bigger** number.
- When you have two negative signs (- -) ⟹ turn the sign to positive (+).

In **multiplying** and **dividing** negative numbers:

- if you have **same signs** (+ +) or (- -) ⟹ The sign of the answer is **positive** (+)
- If you have **different** signs (+ -) ⟹ The sign of the answer is **negative** (-)

Now:

✓ To simplify an expression, you have to collect the **like terms.**

✓ Like terms are terms that have **the same letter and same power (index).**

Expanding brackets:

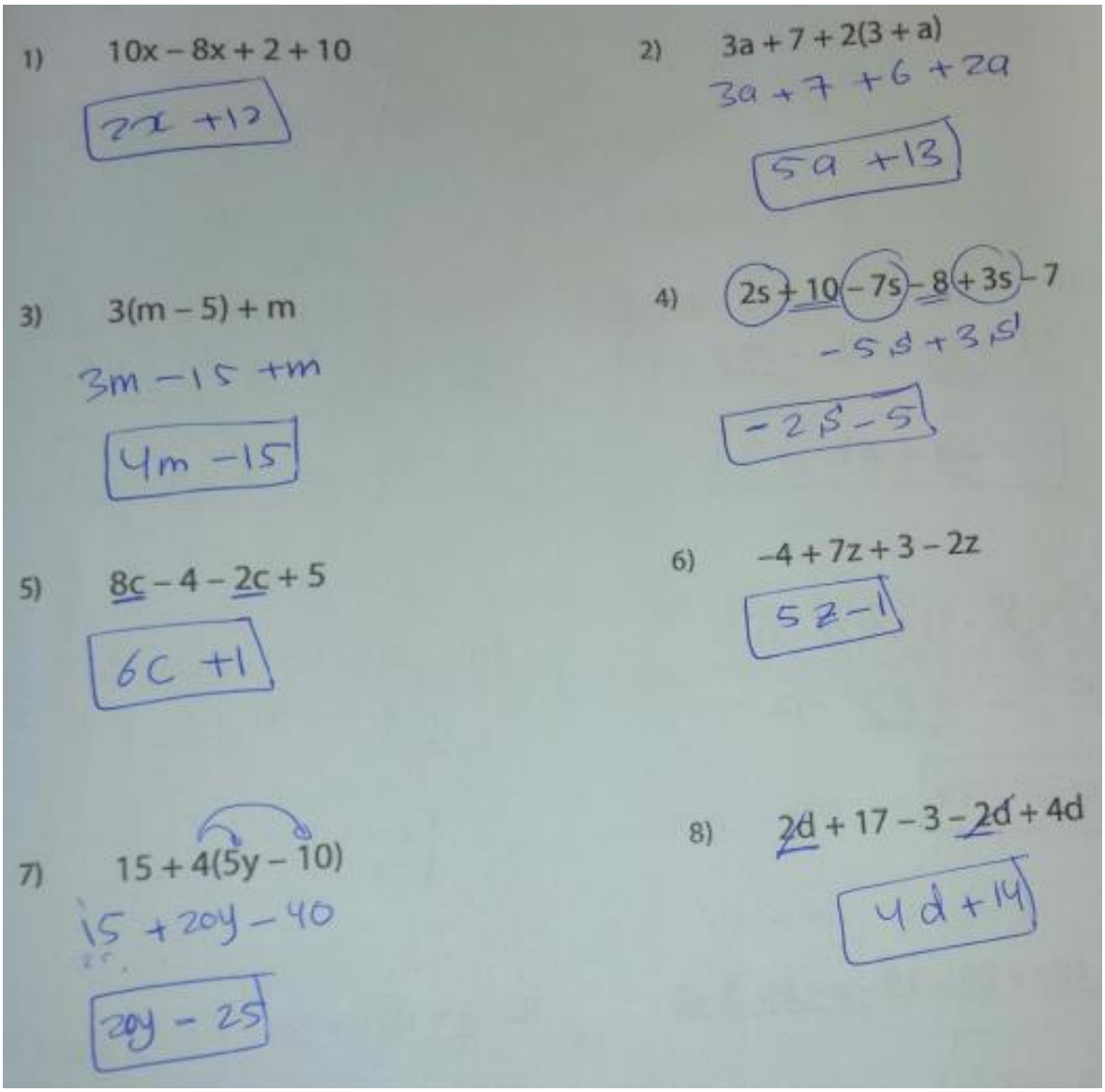
You have to multiply the number outside the brackets by **all** the terms inside the brackets and pay attention for the **signs.**

Example:

2 x (3a + 4) = 2 x 3a + 2 x 4

= **6a + 8**

Exercise (3): Simplify.



9) $4(y+5)+3(2r-4)$

$4y+20+6r-12$

$4y+6r+8$

10) $7-2(a+4)-10a$

$7-2a-8-10a$

$-12a-1$

11) $-2(4t+2u)-5(6t-6u)$

$-8t-4u-30t+30u$

$-38t+26u$

12) $6(u-5v)+10v-5u$

$6u-30v+10v-5u$

$u-20v$

13) $7+8y-2x7t-10y+20t$

$7+8y-14t-10y+20t$

$-2y+6t+7$

14) $4r-1(7y+4)-10r-20y$

$4r-7y-4-10r-20y$

$-6r-27y-4$

15) $2(3x-1)+4(2x-3)$

$6x-2+8x-12$

$14x-14$

16) $4(3y+2x)-3(2y-5x)$

$12y+8x-6y+15x$

$6y+23x$

17) $10a^2 + 2b^2 + 19 - a^2 - b^2 + 3 - b^3$

$9a^2 + b^2 - b^3 + 22$

18) $3m + 2n + 5m + 6 + n + 2m + 3$

$10m + 3n + 9$

Challenging question

Simplify!