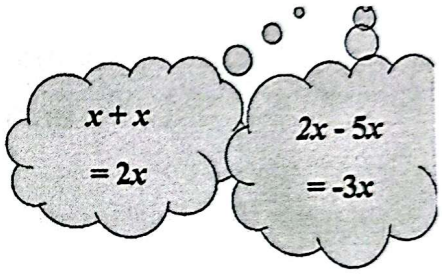
Rosary School \ Marj Elhamam

Name : Answers..... Date : / 11 / 2025

Subject: worksheet 3/ Unit 3 Grade : 6 ( )

Expanding and Simplifying Algebraic Expressions



Q1) Simplify each expression by combining like terms.

a) $4x + 7x =$ 11x

b) $5a + 3a =$ 8a

c) $9y - 4y =$ 5y

d) $12m + 8n + 3m =$ 15m + 8n

e) $6p + 2p + 10 =$ 8p + 10

f) $8k - 5k + 12 =$ 3k + 12

g) $11a + 6b - 4a + 2b =$ 7a + 8b

h) $4a + 9 + 6a - 3 =$ 10a + 6

i) $7y + 3 - 4y + 5 =$ 3y + 8

j) $4a \times 5a =$ $20a^2$

k) $6m \times -2m =$ $-12m^2$

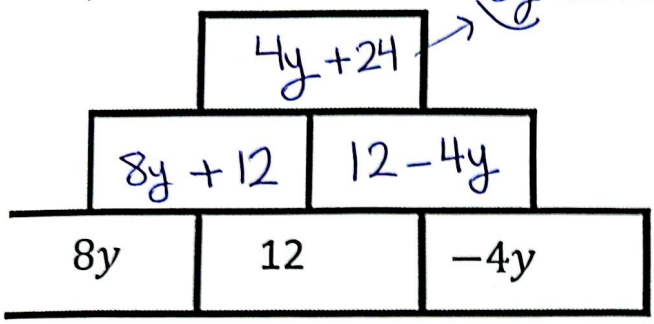
l) $x \times 11 \times y =$ 11xy

m) $5 \times y \times x =$ 5xy

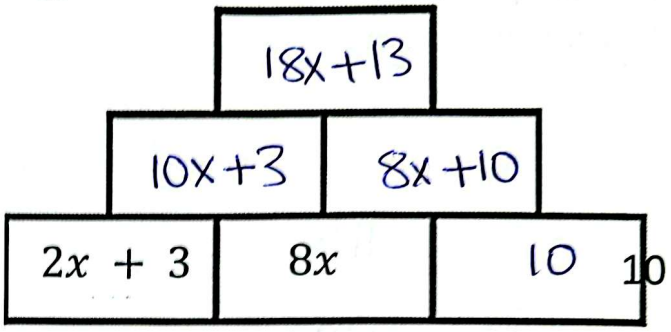
n) $2 \times x \times 4 \times y =$ 8xy

Q2) Complete these addition pyramids.

a)

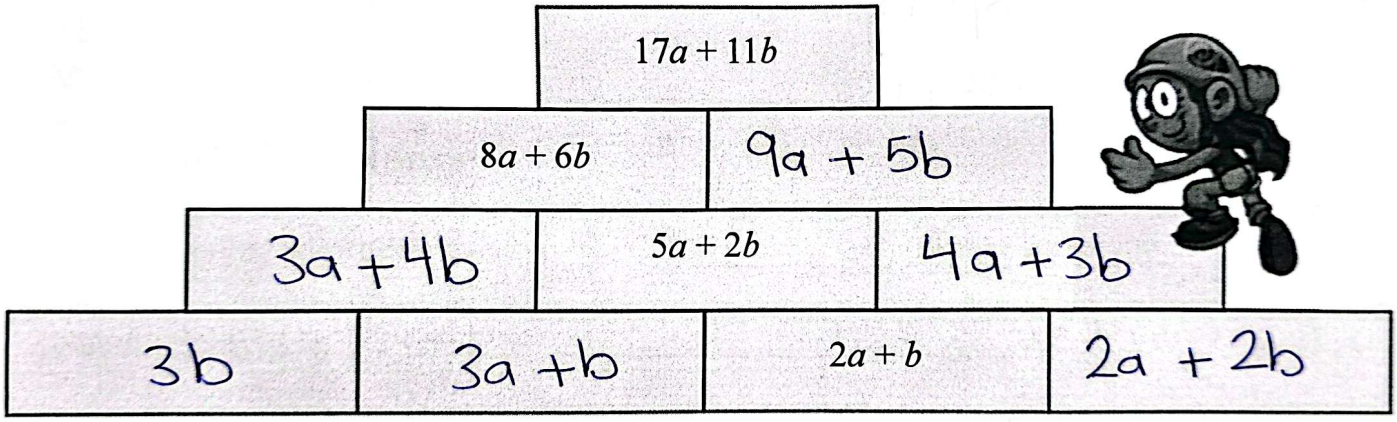


b)



Q3) Complete this algebraic pyramid.

Remember, you find the expression in each block by adding the expressions in the two blocks below it.



Q4) Write each as an expression.

a) Three more than twice ***R*** → $2R+3$

b) Five less than ***X*** → $X-5$

c) Ten more than half ***T*** → $\frac{T}{2}+10$

d) ***B*** divided by 3, then increased by 7 → $\frac{B}{3}+7$

e) Double ***E***, then subtract 9 → $2E-9$

f) ~~The sum of~~ three times ~~a~~ ***S*** → $3s$

Q5) A man is n years old.

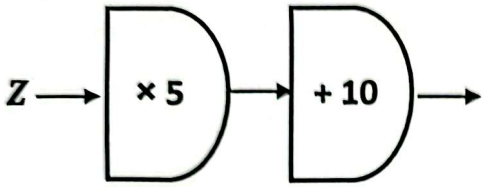
a) How old was he 12 years ago? $n-12$

b) The man's wife is 6 years **younger** than he is. How old is she? $n-6$

c) The man's mother is **twice** his age. How old is she? $2n$

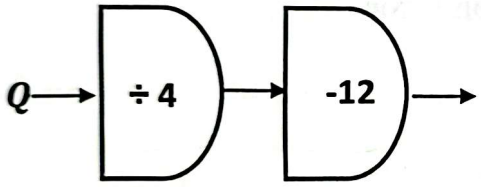
Q6) Write an expression for the output of the function machine.

a)



$5z+10$

b)



$\frac{Q}{4}-12$

Q7) Work out the **value** of each expression.

a) $g + 2f$ when $g = 22$ and $f = 8$

$22+2\times8$

$=22+16$

$=38$

b) $3h - 4w$ when $h = 7$ and $w = 12$

$3\times7 \quad -4\times12$

$=21-48$

$=-27$

c) $\frac{n}{5}$ when $n = 85$

$\frac{85}{5}=17$

d) $\frac{24}{k} - 3v$ when $k = 3$ and $v = 5$

$\frac{24}{3}-3\times5$

$=8-15$

$=-7$

Q8) Find the value of each expression when $a = 2$ and $b = -4$.

a) $3a + b$

$3 \times 2 + -4 = 3 \times 2 - 4$

$= 6 - 4$

$= 2$

b) $5a - 2b$

$5 \times 2 - 2 \times -4$

$10 + 8 = 18$

Q9) A chemist uses the formula

$$C = \frac{m}{V}$$

to calculate the concentration of a solution, where m is the mass of solute (in g) and V is the volume of solution (in L). Work out the concentration C for:

a) 10 g of solute in 2 L of solution

$C = \frac{m}{V} \rightarrow C = \frac{10}{2}$

$C = 5$

b) 25 g of solute in 5 L of solution

$C = \frac{m}{V} \longrightarrow C = \frac{25}{5}$

$C = 5$

Q10) A mechanic uses the formula $F = ma$ to calculate the force on a car, where m is the mass (in kg) and a is the acceleration (in m/s²). Work out the force F on a car with:

a) Mass 1200 kg and acceleration 3 m/s²

$F = m \times a$

$F = 1200 \times 3$

$F = 3600$

b) Mass 800 kg and acceleration 5 m/s²

$F = m \times a$

$F = 800 \times 5$

$F = 4000$

Q11) a) Max has a Saturday job and he earns \$8 per hour.

Write a formula connecting the amount, P, he is paid, in dollars, with the number of hours he works, h.

$P = 8 \times h$

b) A can of soda costs \$0.75.

Write a formula connecting the cost, C, in \$, with the number of cans of soda bought, n.

$C = 0.75 \times n$

c) Amir has £11.

Write a formula to calculate the amount of money Amir has left, A, in £, after spending \$ n.

$A = 11 - n$

Q12) Expand the brackets.

a) $7(5+g) =$ _____

$7 \times 5 + 7 \times g$

$35 + 7g$

b) $11(3s-4) =$ _____

$11 \times 3s + 11 \times -4$

$33s + -44 = 33s - 44$

c) $4x(4-x) =$ _____

$4x \times 4 + 4x \times -x$

$16x + -4x^2$

$16x - 4x^2$

d) $8(6+4w) =$ _____

$8 \times 6 + 8 \times 4w$

$48 + 32w$

Q13) Which one of these expressions is the odd one out?
Explain your answer.

36x+48

$4(9x+12)$

48+36x

$1(48+36x)$

36x+48

$2(18x+24)$

36x+45

$9(4x+5)$

36x+48

$6(6x+8)$

Q14) Samira has 4 beads and 2 pots.

She puts the beads in the pots.

a represents the number of beads in one pot.

b represents the number of beads in the other pot.

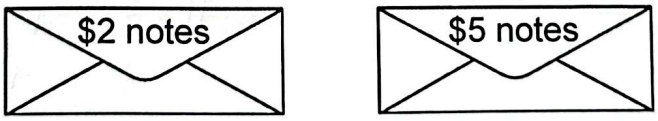
Write all possible sets of values for a and b.

$a =$ 0 and $b =$ 4 / $a =$ 3 and $b =$ 1

$a =$ 4 and $b =$ 0 / $a =$ 2 and $b =$ 2

$a =$ 1 and $b =$ 3

Q15) Eva has some $2 notes and some $5 notes.
She keeps them in two separate envelopes.



A represents the **total amount** in the envelope that contains the $2 notes.
B represents the **total amount** in the envelope that contains the $5 notes.

A + B = $25

Write a possible pair of values for A and B.

A = $ 10

B = $ 15

[1]

Q16) The perimeter, p, of an equilateral triangle with side length, s, is written as

$$p = s + s + s$$

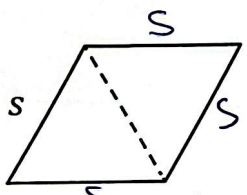
(a) Find the value of p if s = 12 cm.

$P = 12 + 12 + 12$

$P = 36$

_____ cm [1]

(b) Two **identical** equilateral triangles are joined together to make a new shape.



Draw a ring around the correct expression for the perimeter, d, of the new shape.

$d = s + s + s$

$\boxed{d = s + s + s + s}$

$d = s + s + s + s + s$

$d = s + s + s + s + s + s$

[1]

Q13 ,0096/01/O/N/23

Q17) Pierre has some \$1 notes **and** some \$2 notes.
The total value of the notes is \$50

g represents the number of \$1 notes Pierre has.
h represents the number of \$2 notes Pierre has.

(a) Write the value of **g** when **h** is 10

$g + h = 50$
$g + 10 = 50$
$g = 40$

_____ [1]

(b) Write the largest possible value of **h**.

$h = 48$

_____ [1]

Q27, 0096/02/O/N/24

Q18)

Ahmad and Yuri have some pencils

Ahmed and Yuri have some pencils.

Ahmed has **more** pencils than Yuri. Yuri has an **even** number of pencils.

The number of pencils Ahmed has is represented by 

The number of pencils Yuri has is represented by 


45

\+  is greater than 60

If  is 45 write **two** possible values for 

16 or 20 [1]
$45 + 16 = 61$ $45 + 20 = 65$