CHAPTER : INTRODUCTION TO ALGEBRA

EXERCISE : 7.2

1. Evaluate the following expressions, if $x = -7$ **and** $y = 8$.

(a) $3y - 7y$ (b) $4y - 21$ (c) $56 - 8x$ *(d)* $x - y$ *(e)* $y - x$ *(f)* $xy - y$

Solution: -

(a) $3y - 7y = -4y = -4 \times 8 = -32$

(c) $56 - 8x = 56 - 8 \times (-7) = 56 + 56 = 112$

2. Evaluate the following expressions for $a = 9$, $b = 2$ **and** $c = -8$.

(a) $a - b + c$ (b) $3a + 2b - bc$ (c) $c - 7a - 15b$

(d) $21b + 8a - 10c$ (e) $3a - 7b$ (f) $14c - 2b + 15a$

Solution: -

(b) $3a + 2b - bc$

$= 3 \times 9 + 2 \times 2 - 2 \times (-8)$

$= 27 + 4 + 16$

$= 47$

(f) $14c - 2b + 15a$

$= 14 \times (-8) - 2 \times 2 + 15 \times 9$

$= -112 = 4 + 135$

$= 19$

3. Add the following expressions.

(a) $13x, 8x$ (b) $27y, -3y$ (c) $-16p - 2lp - q$

(d) $18, -8x + y$ (e) $a - b, -19 - 2a$ *(f)* $-7yx, -16yz$

Solution:-

(d) $18, -8x + y$

$= 18 + (-8x + y)$

$= 18 - 8x + y$

(e) $a - b, -19 - 2a$

$= (a - b) + (-19 - 2a)$

$= a - b - 19 - 2a$

$= -a - b - 19$

4. Subtract the following expressions.

(a) $5xy$ from $-7xy$ (b) $-a$ from $-b$ (c) $-3ab$ from $3ab$
(d) 15 from $21 - a$ (e) b from $2a - b$ (f) c from $a - b + c$

Solution: -

(a) $5xy$ from $-7xy$

$= -7xy - 5xy$

$= -12xy$

5. Add the following expressions.

(a) $3x + 5y - 7xy$; $15y - 3x + 21xy$; $22xy - 12x - 13y$

(b) $201x + y$; $55y + 10x$; $3x + 4y + xy$

(c) $25a + 46b + 15c - abc$; $a + b + c + abc$; $2a + 3b - 5c - 2abc$

(d) $a - c$; $2a - b$; $b + c - 2abc$; $abc - b - c$

(e) $x - y + xyz$; $z - y - x$; $xyz - z$, $x + y + z + xyz$

Solution:-

(a) $3x + 5y - 7xy$; $15y - 3x + 21xy$; $22xy - 12x - 13y$

$= (3x + 5y - 7xy) + (15y - 3x + 21xy) + (22xy - 12x - 13y)$

$= 3x + 5y - 7xy + 15y - 3x + 21xy + 22xy - 12x - 13y$

$= (3x - 3x - 12x) + (5y + 15y - 13y) + (-7xy + 21xy + 22xy)$

$= -12x + 7y + 36xy$

6. Subtract the following expressions.

(a) $x + y - 3z$ from $2x - 7y + 2\ lz$

(b) $2a - 3b - abc$ *from* $c + 3a+3Ib - abc$

(c) $z - xyz + y$ from $x + y + z$

(d) $5b + 5a\ -c$ from $x - \ b + a + c - \ y$

(e) $7x + 8y - \ xyz$ from $8x - 7y + 3.xyz$

Solution:-

(b) $2a - 3b - abc$ *from* $c + 3a+3Ib - abc$

$= (c + 3a+3Ib - abc) - (2a - 3b - abc\ )$

$= c + 3a + 31b - abc - 2a + 3b + abc$

$= c + (3a - 2a) + (31b + 3b) - abc + abc$

$= c + a + 34\ b$

7. **Write the following expressions as statements.**

(a) $3x - y$ (b) $x + y$ (c) $z - x$ (d) $5a - 2b$ (e) $71 - x + y$

Solution:-

(e) $71 - x + y$

Solution :-

X is subtracted from 71 and the result is added with y

8. Write the expressions for the following statements.

(a) 5 less than three times x.

(b) 86 more than y.

(c) Ganga is 7 years older than Geetha.

(d) Meera had 10 marbles more than Umesh. Mukund had 12 more than Meera. If Umesh has *x* marbles, express the total number of marbles in *x*.

Solution : -

(a) *5* less than three times *x*.

= 3x – 5

(b) 86 more than *y*.

= y + 86

(c) Ganga is 7 years older than Geetha.

Let Geetha's age = x years

Ganga's age = (x + 7) years

(d) Meera had 10 marbles more than Umesh. Mukund had 12 more than Meera. If Umesh has *x* marbles, express the total number of marbles in *x*.

Umesh has = x marbles

Meera has = x + 10

Mukund has = x + 10 + 12

Therefore , total marbles = x + (x + 10) + (x + 22) = 3x + 32

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9. **Simplify:**

(a) *3a – 2b – c –5a*+ 7c – *abc* – 166 + *15a*

(b) *12p – r – 2q – pqr* – 18p + *I6q* + 17r – *11pq*

(c) *x + xyz* – *z + y + 20x*– 4 I *y* – 31 *z* – 19*xyz*

(d) 14a – *b* – *c* – *15b* – *abc* + 18a + *9b* + *c*

(e) *y – x + z* – *xyz* – *2y* – *2x* – *2z* – *2xyz*

Solution : -

(a) *3a – 2b – c –5a*+ 7c – *abc* – 166 + *15a*

= (3 – 5 + 15) a - 2b + (- 1 + 7) c - abc – 166

= 13a – 2b + 6c – abc – 166

(c) $x + xyz - z + y + 20x - 4\text{ I } y - 31\ z - 19xyz$

$= x + xyz - z + y + 20x - 41\ y - 31\ z - 19xyz$

$= (1 + 20)\ x + (1 - 19)\ xyz + (-1 - 31)\ z + (1 - 41)\ y$

$= 21x - 18xyz - 32z - 40y$

Note :

(1) What to be added with a to get b ? = b – a

(2) What to be subtracted from a to get b? = a – b

What to be added with 20 to get 36 ?

The required number = 36 – 20 = 16

What to be subtracted from 15 to get 8?

Required number to be subtracted = 15 – 8 = 7

10. What should be subtracted from 21 $a - 2b - 3c$ to get $a + b -$ 2c?

Solution: -

The required expression = $(21\ a - 2b - 3c) - (a + b - 2c)$

$= 21a - 2b - 3c - a - b + 2c$

$= (21 - 1)\ a + (-2 - 1)\ b + (-3 + 2)\ c$

$= 20a - 3b - c$

Therefore $20a - 3b - c$ should be subtracted from 21 $a - 2b - 3c$ to get $a + b -$ 2c.

11. What should be added to $2a + 7b$ to get $-17a - 3b$?

12. Subtract $a + b + c$ from the sum of $a +$ band $b + 2a + c$.