NCERT SOLUTIONS

CLASS - 7TH

aglasem.com

Class : 7th
Subject : Maths
Chapter : 12
Chapter Name : Algebraic Expressions

Exercise 12.1

Q1 Get the algebraic expressions in the following cases using variables, constants and arithmetic operations.
(i) Subtraction of z from y.
(ii) One-half of the sum of numbers x and y.
(iii) The number z multiplied by itself.
(iv) One-fourth of the product of numbers p and q.
(v) Numbers x and y both squared and added.
(vi) Number 5 added to three times the product of numbers m and n.
(vii) Product of numbers y and z subtracted from 10.
(viii) Sum of numbers a and b subtracted from their product.

Answer. (i) y - z
(ii) $\frac{1}{2}(x+y)$
(iii)z^2
(iv)$^{\frac{1}{4}(pq)}$
$(\mathrm{v})\ x^2+y^2$
$(\mathrm{vi})\ 5+3(mn)$
$(\mathrm{vil})\ 10-yz$
$(\mathrm{viii})\ ab-(a+b)$

aglasem.com

Page : 234 , Block Name : Exercise 12.1

Q2 (i) Identify the terms and their factors in the following expressions Show the terms and factors by tree diagrams.
(a) x – 3
(b) 1 + x + x^2
(c) y – y^3
(d) 5xy^2 + 7x^2 y
(e) – ab + 2b^2 – 3a^2
(ii) Identify terms and factors in the expressions given below:
(a) – 4x + 5
(b) – 4x + 5y
(c) 5y + 3y^2
(d) xy + 2x^2 y^2
(e) pq + q

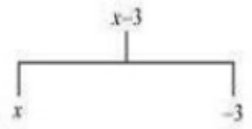
(f) 1.2 ab − 2.4 b + 3.6 a

$\frac{3}{4}x + \frac{1}{4}$

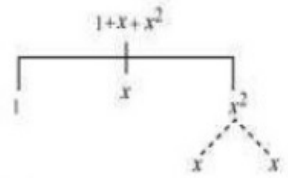
(h) 0.1 p^2 + 0.2 q^2

Answer. (i)

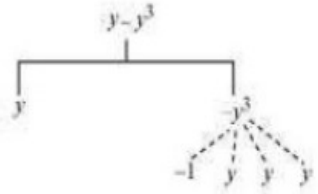
(a)

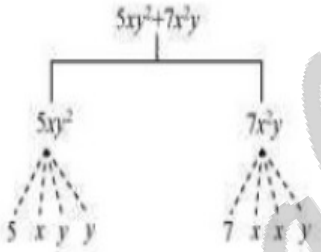


(b)

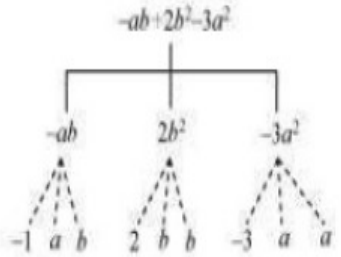


(c)





(e)



(ii)

aglasem.com

Row	Expression	Terms	Factors
(a)	$-4x + 5$	$-4x$ 5	$-4, x$ 5
(b)	$-4x + 5y$	$-4x$ $5y$	$-4, x$ $5, y$
(c)	$5y + 3y^2$	$5y$ $3y^2$	$5, y$ $3, y, y$
(d)	$xy + 2x^2y^2$	xy $2x^2y^2$	x, y $2, x, x, y, y$
(e)	$pq + q$	pq q	p, q q
(f)	$1.2ab - 2.4b + 3.6a$	$1.2ab$ $-2.4b$ $3.6a$	$1.2, a, b$ $-2.4, b$ $3.6, a$
(g)	$\frac{3}{4}x+\frac{1}{4}$	$\frac{3}{4}x$ $\frac{1}{4}$	$\frac{3}{4}, x$ $\frac{1}{4}$
(h)	$0.1p^2 + 0.2q^2$	$0.1p^2$ $0.2q^2$	$0.1, p, p$ $0.2, q, q$

Page : 234 , Block Name : Exercise 12.1

Q3 Identify the numerical coefficients of terms (other than constants) in the following expressions:
(i) $5 - 3t^2$
(ii) 1 + t + t^2 + t 3
(iii) x + 2xy + 3y
(iv) 100m + 1000n
(v) $-p^2 q^2$ + 7pq
(vi) 1.2 a + 0.8 b
(vii) 3.14 r^2
(viii) 2 (l + b)
(ix) 0.1 y + 0.01 y^2

Answer.

aglasem.com

Row	Expression	Terms	Coefficients
(i)	$5 - 3t^2$	$-3t^2$	-3
(ii)	$1 + t + t^2 + t^3$	t t^2 t^3	1 1 1
(iii)	$x + 2xy + 3y$	x $2xy$ $3y$	1 2 3
(iv)	$100m + 1000n$	$100m$ $1000n$	100 1000
(v)	$-p^2q^2 + 7pq$	$-p^2q^2$ $7pq$	-1 7
(vi)	$1.2a + 0.8b$	$1.2a$ $0.8b$	1.2 0.8
(vii)	$3.14\ r^2$	$3.14\ r^2$	3.14
(viii)	$2(l + b)$	$2l$ $2b$	2 2
(ix)	$0.1y + 0.01y^2$	$0.1y$ $0.01y^2$	0.1 0.01

Page : 235 , Block Name : Exercise 12.1

Q4 (a) Identify terms which contain x and give the coefficient of x.
(i) y^2 x + y
(ii) $13y^2$ – 8yx
(iii) x + y + 2
(iv) 5 + z + zx
(v) 1 + x + xy
(vi) $12xy^2$ + 25
(vii) 7x + xy^2
(b) Identify terms which contain y^2 and give the coefficient of y^2 .
(i) 8 – xy^2
(ii) $5y^2$ + 7x
(iii) $2x^2$ y – $15xy^2$ + $7y^2$

Answer.

aglasem.com

(a)

Row	Expression	Terms with x	Coefficient of x
(i)	$y^2x + y$	y^2x	y^2
(ii)	$13y^2 - 8yx$	$-8yx$	$-8y$
(iii)	$x + y + 2$	x	1
(iv)	$5 + z + zx$	zx	z
(v)	$1 + x + xy$	x xy	1 y
(vi)	$12xy^2 + 25$	$12xy^2$	$12y^2$
(vii)	$7 + xy^2$	xy^2	y^2

(b)

Row	Expression	Terms with y^2	Coefficient of y^2
(i)	$8 - xy^2$	$-xy^2$	$-x$
(ii)	$5y^2 + 7x$	$5y^2$	5
(iii)	$2x^2y + 7y^2$ $-15xy^2$	$7y^2$ $-15xy^2$	7 $-15x$

Page : 235 , Block Name : Exercise 12.1

Q5 Classify into monomials, binomials and trinomials.
(i) 4y – 7z
(ii) y^2
(iii) x + y – xy
(iv) 100
(v) ab – a – b
(vi) 5 – 3t
(vii) $4p^2$ q – 4pq^2
(viii) 7mn
(ix) z^2 – 3z + 8
(x) $a^2 + b^2$
(xi) z^2 + z
(xii) 1 + x + x^2

Answer. The monomials, respectively. binomials, and trinomials have 1, 2, and 3 unlike terms in it
(i) Binomial
(ii) Monomial
(iii) Trinomial
(iv) Monomial
(v) Trinomial
(vi) Binomial
(vii) Binomial
(viii) Monomial
(ix) Trinomial
(x) Binomial
(xi) Binomial
(xii) Trinomial

aglasem.com

Page : 235 , Block Name : Exercise 12.1

Q6 State whether a given pair of terms is of like or unlike terms.
(i) 1, 100
(ii) $-7x, \frac{5}{2}x$
(iii) – 29x, – 29y
(iv) 14xy, 42yx
(v) $4m^2$ p, 4mp^2
(vi) 12xz, $12x^2\ z^2$

Answer. The terms which have the same algebraic factors are called like terms. However, when the terms have different algebraic factors, these are called unlike terms.
(i) Like
(ii) LikeLike
(iii) Unlike
(iv) Like
(v) Unlike
(vi) Unlike

Page : 235 , Block Name : Exercise 12.1

Q7 Identify like terms in the following:
(a)
$-xy^2, -4yx^2, 8x^2, 2xy^2, 7y, -11x^2, -100x, -11yx, 20x^2y$
$-6x^2, y, 2xy, 3x$
(b)
$10pq, 7p, 8q, -p^2q^2, -7qp, -100q, -23, 12q^2p^2, -5p^2, 41, 2405p, 78qp$
$13p^2q, qp^2, 701p^2$

Answer.
(a) $-xy^2, 2xy^2$
$-4yx^2, 20x^2y$
$8x^2, -11x^2, -6x^2$
$7y, y$
$-100x, 3x$
$-11xy, 2xy$
(b) $10pq, -7qp, 78qp$
$7p, 2405p$
$8q, -100q$
$-p^2q^2, 12p^2q^2$
$-23, 41$
$-5p^2, 701p^2$
$13p^2q, qp^2$

Page : 235 , Block Name : Exercise 12.1

aglasem.com

Exercise 12.2

Q1 Simplify combining like terms:

(i) $21b - 32 + 7b - 20b$

(ii) $-z^2 + 13z^2 - 5z + 7z^3 - 15z$

(iii) $p - (p - q) - q - (q - p)$

(iv) $3a - 2b - ab - (a - b + ab) + 3ab + b - a$

(v) $5x^2y - 5x^2 + 3yx^2 - 3y^2 + x^2 - y^2 + 8xy^2 - 3y^2$

(vi) $\left(3y^2 + 5y - 4\right) - \left(8y - y^2 - 4\right)$

Answer. (i) 21b - 32 + 7b- 20b = 21b + 7b - 20b - 32

= b (21 +7 - 20) -32

= - 8b - 32

$(ii) -z^2 + 13z^2 - 5z + 7z^3 - 15z = 7z^3 - z^2 + 13z^2 - 5z - 15z$

$= 7z^3 + z^2(-1 + 13) + z(-5 - 15)$

$= 7z^3 + 12z^2 - 20z$

(iii) p — (p — q) —q — (q — p) = p —p + q—q—q+p = p - q

(iv) 3a — 2b — ab — (a — b + ab) + 3ba + b — a

= 3a — 2b — ab — a + b - ab + 3ba + b — a

= 3a — a — a — 2b + b + b — ab — ab + 3ab

$= a(3 - 1 - 1) + b(-2 + 1 + 1) + ab(-1 - 1 + 3)$

$= a + ab$

$(v) 5x^2y - 5x^2 + 3yx^2 - 3y^2 + x^2 - y^2 + 8xy^2 - 3y^2$

$= 5x^2y + 3yx^2 - 5x^2 + x^2 - 3y^2 - y^2 - 3y^2 + 8xy^2$

$= x^2y(5 + 3) + x^2(-5 + 1) + y^2(-3 - 1 - 3) + 8xy^2$

$= 8x^2y - 4x^2 - 7y^2 + 8xy^2$

$(vi) \left(3y^2 + 5y - 4\right) - \left(8y - y^2 - 4\right)$

$= 3y^2 + 5y - 4 - 8y + y^2 + 4$

$= 3y^2 + y^2 + 5y - 8y - 4 + 4$

$= y^2(3 + 1) + y(5 - 8) + 4(1 - 1)$

$= 4y^2 - 3y$

Page : 239 , Block Name : Exercise 12.2

Q2 Add:

(i) $3mn, -5mn, 8mn, -4mn$

(ii) $t - 8tz, 3tz - z, z - t$

(iii) $-7mn + 5, 12mn + 2, 9mn - 8, -2mn - 3$

(iv) $a + b - 3, b - a + 3, a - b + 3$

(iv) $14x + 10y - 12xy - 13, 18 - 7x - 10y + 8xy, 4xy$

(vi) $5m - 7n, 3n - 4m + 2, 2m - 3x - 10y + 8xy, 4xy$

(vi) $4x^2y, -3xy^2, -5xy^2, 5x^2y$

aglasem.com

(viii) $3p^2q^2 - 4pq + 5, -10p^2q^2, 15 + 9pq + 7p^2q^2$

(ix) $ab - 4a, 4b - ab, 4a - 4b$

(x) $x^2 - y^2 - 1, y^2 - 1 - x^2, 1 - x^2 - y^2$

Answer.

(i) $3mn + (-5mn) + 8mn + (-4mn) = mn(3 - 5 + 8 - 4)$

$= 2mn$

(ii) $(t - 8tz) + (3tz - z) + (z - t) = t - 8tz + 3tz - z + z - t$

$= t - t - 8tz + 3tz - z + z$

$= t(1 - 1) + tz(-8 + 3) + z(-1 + 1)$

$= -5tz$

(iii) $(-7mn + 5) + (12mn + 2) + (9mn - 8) + (-2mn - 3)$

$= -7mn + 5 + 12mn + 2 + 9mn - 8 - 2mn - 3$

$= -7mn + 12mn + 9mn - 2mn + 5 + 2 - 8 - 3$

$= mn(-7 + 12 + 9 - 2) + (5 + 2 - 8 - 3)$

$= 12mn - 4$

(iv)(a) $+ b - 3) + (b - a + 3) + (a - b + 3)$

$= a + b - 3 + b - a + 3 + a - b + 3$

$= a - a + a + b + b - b - 3 + 3 + 3$

$= a(1 - 1 + 1) + b(1 + 1 - 1) + 3(-1 + 1 + 1)$

$= a + b + 3$

$(v)(14x + 10y - 12xy - 13) + (18 - 7x - 10y + 8yx) + 4xy$

$= 14x + 10y - 12xy - 13 + 18 - 7x - 10y + 8yx + 4xy$

$= 14x - 7x + 10y - 10y - 12xy + 8yx + 4xy - 13 + 18$

$= x(14 - 7) + y(10 - 10) + xy(-12 + 8 + 4) - 13 + 18$

$= 7x + 5$

$(vi)(5m - 7n) + (3n - 4m + 2) + (2m - 3mn - 5)$

$= 5m - 7n + 3n - 4m + 2 + 2m - 3mn - 5$

$= 5m - 4m + 2m - 7n + 3n - 3mn + 2 - 5$

$= m(5 - 4 + 2) + n(-7 + 3) - 3mn + 2 - 5$

$= 3m - 4n - 3mn - 3$

(vii) $4x^2y - 3xy^2 - 5xy^2 + 5x^2y = 4x^2y + 5x^2y - 3xy^2 - 5xy^2$

$= x^2y(4 + 5) + xy^2(-3 - 5)$

$= 9x^2y - 8xy^2$

(ix)$(ab - 4a) + (4b - ab) + (4a - 4b)$

$= ab - 4a + 4b - ab + 4a - 4b$

$= ab - ab - 4a + 4a + 4b - 4b$

$= ab(1 - 1) + a(-4 + 4) + b(4 - 4)$

$= 0$

aglasem.com

$(x)\left(x^2-y^2-1\right)+\left(y^2-1-x^2\right)+\left(1-x^2-y^2\right)$
$=x^2-y^2-1+y^2-1-x^2+1-x^2-y^2$
$=x^2-x^2-x^2-y^2+y^2-y^2-1-1+1$
$=x^2(1-1-1)+y^2(-1+1-1)+(-1-1+1)$
$=-x^2-y^2-1$

Page : 239 , Block Name : Exercise 12.2

Q3 Subtract:
(i) $-5y^2$ from y^2
(ii) $6xy$ from $-12xy$
(iii) $(a-b)$ from $(a+b)$
(iv) $a(b-5)$ from $b(5-a)$
(v) $-m^2+5mn$ from $4m^2-3mn+8$
(vi) $-x^2+10x-5$ from $5x-10$
(vi) $5a^2-7ab+5b^2$ from $3ab-2a^2-2b^2$
(vii) $4pq-5q^2-3p^2$ from $5p^2+3q^2-pq$

Answer.
(i) $y^2-\left(-5y^2\right)=y^2+5y^2=6y^2$
(ii) $-12xy-(6xy)=-18xy$
(iii) $(a+b)-(a-b)=a+b-a+b=2b$
(iv) $b(5-a)-a(b-5)=5b-ab-ab+5a$
$=5a+5b-2ab$
(v) $\left(4m^2-3mn+8\right)-\left(-m^2+5mn\right)=4m^2-3mn+8+m^2-5mn$
$=4m^2+m^2-3mn-5mn+8$
$=5m^2-8mn+8$
(vi) $(5x-10)-\left(-x^2+10x-5\right)=5x-10+x^2-10x+5$
$=x^2+5x-10x-10+5$
$=x^2-5x-5$
(vii) $\left(3ab-2a^2-2b^2\right)-\left(5a^2-7ab+5b^2\right)$
$=3ab-2a^2-2b^2-5a^2+7ab-5b^2$
$=3ab+7ab-2a^2-5a^2-2b^2-5b^2$
$=10ab-7a^2-7b^2$
(vili) $4pq-5q^2-3p^2$ from $5p^2+3q^2-pq$
$\left(5p^2+3q^2-pq\right)-\left(4pq-5q^2-3p^2\right)$
$=5p^2+3q^2-pq-4pq+5q^2+3p^2$
$=5p^2+3p^2+3q^2+5q^2-pq-4pq$
$=8p^2+8q^2-5pq$

Page : 240 , Block Name : Exercise 12.2

Q4 (a) What should be added to x^2+xy+y^2 to obtain $2x^2+3xy$?(b) What should be subtracted from

aglasem.com

2a + 8b + 10 to get – 3a + 7b + 16?

Answer. (a) Let a be the required term.

$a + \left(x^2 + y^2 + xy\right) = 2x^2 + 3xy$

$a = 2x^2 + 3xy - \left(x^2 + y^2 + xy\right)$

$a = 2x^2 + 3xy - x^2 - y^2 - xy$

$a = 2x^2 - x^2 - y^2 + 3xy - xy$

$= x^2 - y^2 + 2xy$

(b) Let p be the required term.

$(2a + 8b + 10) - p = -3a + 7b + 16$

$p = 2a + 8b + 10 - (-3a + 7b + 16)$

$= 2a + 8b + 10 + 3a - 7b - 16$

$= 2a + 3a + 8b - 7b + 10 - 16$

$= 5a + b - 6$

Page : 240 , Block Name : Exercise 12.2

Q5 What should be taken away from $3x^2 - 4y^2 + 5xy + 20$ to obtain $-x^2 - y^2 + 6xy + 20$?

Answer. Let p be the required term.

$\left(3x^2 - 4y^2 + 5xy + 20\right) - p = -x^2 - y^2 + 6xy + 20$

$p = \left(3x^2 - 4y^2 + 5xy + 20\right) - \left(-x^2 - y^2 + 6xy + 20\right)$

$= 3x^2 - 4y^2 + 5xy + 20 + x^2 + y^2 - 6xy - 20$

$= 3x^2 + x^2 - 4y^2 + y^2 + 5xy - 6xy + 20 - 20$

$= 4x^2 - 3y^2 - xy$

Page : 240 , Block Name : Exercise 12.2

Q6 (a) From the sum of 3x – y + 11 and – y – 11, subtract 3x – y – 11.
(b) From the sum of 4 + 3x and 5 – 4x + $2x^2$, subtract the sum of $3x^2$ – 5x and $-x^2$ + 2x + 5.

Answer.

(a) $(3x - y + 11) + (-y - 11)$

$= 3x - y + 11 - y - 11$

$= 3x - y - y + 11 - 11$

$= 3x - 2y$

$(3x - 2y) - (3x - y - 11)$

$= 3x - 2y - 3x + y + 11$

$= 3x - 3x - 2y + y + 11$

$= -y + 11$

aglasem.com

$(b)(4+3x)+\left(5-4x+2x^2\right)=4+3x+5-4x+2x^2$
$=3x-4x+2x^2+4+5$
$=-x+2x^2+9$
$\left(3x^2-5x\right)+\left(-x^2+2x+5\right)=3x^2-5x-x^2+2x+5$
$=3x^2-x^2-5x+2x+5$
$=2x^2-3x+5$
$\left(-x+2x^2+9\right)-\left(2x^2-3x+5\right)$
$=-x+2x^2+9-2x^2+3x-5$
$=-x+3x+2x^2-2x^2+9-5$
$=2x+4$

Page : 240 , Block Name : Exercise 12.2

Exercise 12.3

Q1 If m = 2, find the value of: (i) m – 2 (ii) 3m – 5 (iii) 9 – 5m
$3m^2-2m-7$ (v) $\frac{5m}{2}$ 4

Answer. (i) m -2=2-2-0
(ii) $3m-5=(3\times 2)-5=6-5=1$
(iii) $9-5m=9-(5\times 2)=9-10=-1$
(iv) $3m^2-2m-7=3\times(2\times 2)-(2\times 2)-7$
$=12-4-7=1$
(iv) $\frac{5m}{2}-4=\left(\frac{5\times 2}{2}\right)-4=1$

Page : 242 , Block Name : Exercise 12.3

Q2 If p = – 2, find the value of:
$4p+7$ (ii) $-3p^2+4p+7$ (iii) $-2p^3-3p^2+4p+7$

Answer.
(i) $4p+7=4\times(-2)+7=-8+7=-1$
(ii) $-3p^2+4p+7=-3(-2)\times(-2)+4\times(-2)+7$
$=-12-8+7=-13$
(iii) $-2p^3-3p^2+4p+7$
$=-2(-2)\times(-2)\times(-2)-3(-2)\times(-2)+4\times(-2)+7$
$=16-12-8+7=3$

Page : 242 , Block Name : Exercise 12.3

Q3 Find the value of the following expressions, when x = –1:
(i) 2x – 7 (ii) – x + 2 (iii) x^2 + 2x + 1 (iv) $2x^2$ – x – 2

aglasem.com

Answer. (i) 2x - 7 = 2 x (-1) - 7 = -9

$(\text{ii})\ -x+2=-(-1)+2=1+2=3$

$(\text{iii})\ x^2+2x+1=(-1)\times(-1)+2\times(-1)+1$

$=1-2+1=0$

$(\text{iv})\ 2x^2-x-2=2(-1)\times(-1)-(-1)-2$

$=2+1-2=1$

Page : 242 , Block Name : Exercise 12.3

Q4 If a = 2, b = – 2, find the value of:
(i) a^2 + b^2 (ii) a^2 + ab + b^2 (iii) a^2 - b^2

Answer.

$(\text{i})a^2+b^2$

$=(2)^2+(-2)^2=4+4=8$

$(\text{ii})\ a^2+ab+b^2$

$=(2\times2)+2\times(-2)+(-2)\times(-2)$

$=4-4+4=4$

$(\text{iii})\ a^2-b^2$

$=(2)^2-(-2)^2=4-4=0$

Page : 242 , Block Name : Exercise 12.3

Q5 When a = 0, b = – 1, find the value of the given expressions:
$(\text{i})\ 2a+2b$ $(\text{ii})\ 2a^2+b^2+1$ $(\text{iii})\ 2a^2b+2ab^2+ab$
a^2+ab+2

Answer. (i) 2a + 2b = 2 x (0) + 2 x (-1) = 0 - 2 = -2

$(\text{ii})\ 2a^2+b^2+1$

$=2\times(0)^2+(-1)\times(-1)+1$

$=0+1+1=2$

$(\text{iii})\ 2a^2b+2ab^2+ab$

$=2\times(0)^2\times(-1)+2\times(0)\times(-1)\times(-1)+0\times(-1)$

$=0+0+0=0$

$(\text{iv})a^2+ab+2$

$=(0)^2+0\times(-1)+2$

$=0+0+2=2$

Page : 242 , Block Name : Exercise 12.3

Q6 Simplify the expressions and find the value if x is equal to 2
(i) x + 7 + 4 (x – 5)
(ii) 3 (x + 2) + 5x – 7

aglasem.com

(iii) 6x + 5 (x – 2)
(iv) 4(2x – 1) + 3x + 11

Answer.
$(\text{i})\ x + 7 + 4(x - 5) = x + 7 + 4x - 20$
$= x + 4x + 7 - 20$
$= 5x - 13$
$= (5 \times 2) - 13$
$= 10 - 13 = -3$
$(\text{ii})\ 3(x + 2) + 5x - 7 = 3x + 6 + 5x - 7$
$= 3x + 5x + 6 - 7 = 8x - 1$
$= (8 \times 2) - 1 = 16 - 1 = 15$
$(\text{iii})\ 6x + 5(x - 2) = 6x + 5x - 10$
$= 11x - 10$
$= (11 \times 2) - 10 = 22 - 10 = 12$
$(\text{iv})\ 4(2x - 1) + 3x + 11 = 8x - 4 + 3x + 11$
$= 11x + 7$
$= (11 \times 2) + 7$
$= 22 + 7 = 29$

Page : 242 , Block Name : Exercise 12.3

Q7 Simplify these expressions and find their values if x = 3, a = – 1, b = – 2.
(i) 3x – 5 – x + 9
(ii) 2 – 8x + 4x + 4
(iii) 3a + 5 – 8a + 1
(iv) 10 – 3b – 4 – 5b
(v) 2a – 2b – 4 – 5 + a

Answer.
$(\text{i})\ 3x - 5 - x + 9 = 3x - x - 5 + 9$
$= 2x + 4 = (2 \times 3) + 4 = 10$
$(\text{ii})\ 2 - 8x + 4x + 4 = 2 + 4 - 8x + 4x$
$= 6 - 4x = 6 - (4 \times 3) = 6 - 12 = -6$
$(\text{iii})\ 3a + 5 - 8a + 1 = 3a - 8a + 5 + 1$
$= -5a + 6 = -5 \times (-1) + 6$
$= 5 + 6 = 11$
$(\text{iv})\ 10 - 3b - 4 - 5b = 10 - 4 - 3b - 5b$
$= 6 - 8b = 6 - 8 \times (-2)$
$= 6 + 16 = 22$
$(v) 2a - 2b - 4 - 5 + a = 2a + a - 2b - 4 - 5$
$= 3a - 2b - 9s$
$= 3 \times (-1) - 2(-2) - 9$
$= -3 + 4 - 9 = -8$

Page : 242 , Block Name : Exercise 12.3

aglasem.com

Q8 (i) If z = 10, find the value of $z^3 - 3(z - 10)$.
(ii) If p = – 10, find the value of $p^2 - 2p - 100$

Answer.
$(i) z^3 - 3(z - 10) = z^3 - 3z + 30$
$= (10 \times 10 \times 10) - (3 \times 10) + 30$
$= 1000 - 30 + 30 = 1000$
$(ii) p^2 - 2p - 100$
$= (-10) \times (-10) - 2(-10) - 100$
$= 100 + 20 - 100 = 20$

Page : 242 , Block Name : Exercise 12.3

Q9 What should be the value of a if the value of $2x^2$+ x – a equals to 5, when x = 0?

Answer.
$2x^2 + x - a = 5, \text{ when } x = 0$
$(2 \times 0) + 0 - a = 5$
$0 - a = 5$
$a = -5$

Page : 242 , Block Name : Exercise 12.3

Q10 Simplify the expression and find its value when a = 5 and b = – 3.
2(a^2 + ab) + 3 – ab

Answer.
$2\left(a^2 + ab\right) + 3 - ab = 2a^2 + 2ab + 3 - ab$
$= 2a^2 + 2ab - ab + 3$
$= 2a^2 + ab + 3$
$= 2 \times (5 \times 5) + 5 \times (-3) + 3$
$= 50 - 15 + 3 = 38$

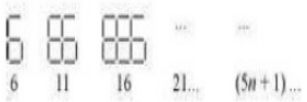
Page : 242 , Block Name : Exercise 12.3

Exercise 12.4

Q1 Observe the patterns of digits made from line segments of equal length. You will find such segmented digits on the display of electronic watches or calculators.

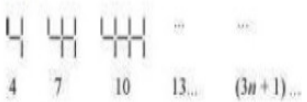
aglasem.com

(a)



6 11 16 21... (5*n* + 1)...

(b)



4 7 10 13... (3*n* + 1)...

(c)

7 12 17 22... (5*n* + 2)...

If the number of digits formed is taken to be *n*, the number of segments required to form *n* digits is given by the algebraic expression appearing on the right of each pattern.

How many segments are required to form 5, 10, 100 digits of the kind –

Answer. (a) It is given that the number of segments required to form n digits of the kind

is (5*n* + 1).

Number of segments required to form 5 digits = (5 x 5 + 1)
= 25 +1 = 26
Number of segments required to form 10 digits = (5 x 10 + 1)
= 50 +1 = 51
Number of segments required to form 100 digits = (5 x 100 + 1)
= 500 +1 = 501

(b) It is given that the number of segments required to form *n* digits of the kind  is (3*n* + 1).

Number of segments required to form 5 digits = (3 x 5 + 1)
= 15 +1 = 16
Number of segments required to form 10 digits = (3 x 10 + 1)
= 30 +1 = 31
Number of segments required to form 100 digits = (3 x 100 + 1)
= 300 +1 = 301

(c)It is given that the number of segments required to form *n* digits of the kind  is (5*n* + 2).

Number of segments required to form 5 digits = (5 x 5 + 2)
= 25 +2 = 27
Number of segments required to form 10 digits = (5 x 10 + 2)
= 50 +2 = 52
Number of segments required to form 100 digits = (5 x 100 + 2)
= 500 +2 = 502

Page : 246 , Block Name : Exercise 12.4

Q2 Use the given algebraic expression to complete the table of number patterns.

S. No.	Expression	Terms									
		1st	2nd	3rd	4th	5th	...	10th	...	100th	...
(i)	$2n-1$	1	3	5	7	9	-	19	-	-	-
(ii)	$3n+2$	5	8	11	14	-	-	-	-	-	-
(iii)	$4n+1$	5	9	13	17	-	-	-	-	-	-
(iv)	$7n+20$	27	34	41	48	-	-	-	-	-	-
(v)	n^2+1	2	5	10	17	-	-	-	-	10,001	-

Answer.

aglasem.com

S.No.	Expression	Terms									
		1st	2nd	3rd	4th	5th	...	10th	...	100th	...
(i)	$2n - 1$	1	3	5	7	9	-	19	-	199	-
(ii)	$3n + 2$	2	5	8	11	17	-	32	-	302	-
(iii)	$4n + 1$	5	9	13	17	21	-	41	-	401	-
(iv)	$7n + 20$	27	34	41	48	55	-	90	-	720	-
(v)	$n^2 + 1$	2	5	10	17	26	-	101	-	10,001-	-

Page : 247 , Block Name : Exercise 12.4

aglasem.com