Western Cape Government

Western Cape Education Department
Directorate: Curriculum FET

TECHNICAL MATHEMATICS

RESOURCE PACK
2025 TERM 1

Grade 10

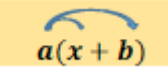
This resource pack is designed to support you in engaging with the essential content and skills that will be covered during the upcoming term. Its purpose is to help you grasp key concepts, establish the required standards, and apply the knowledge necessary to succeed in your work and assessments.

The resource pack covers the following topics:

1. Products
2. Factorisation
3. Exponents
4. Algebraic fractions

1. PRODUCTS

Multiplying a monomial and a binomial:



Example 1

Simplify: $2a(a-1)-3(a^2-1)$

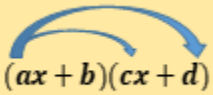
Solution:

$$2a^2-2a-3a^2+3$$
$$=-a^2-2a+3$$

Try this:

$$3x(x-4)-(x^2+2)$$

Multiplying two binomials:



Example 2

Simplify: $(2x-3)(4x-5)$

Solution :

$$8x^2-10x-12x+15$$
$$=8x^2-22x+15$$

Try this

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

Example 3

Simplify: $(2x-3)(2x+3)$

Solution :

$$4x^2-6x-6x-9$$
$$=4x^2-9$$

Try this:

$$(3x-4)(3x+4)$$

Example 4.1

Simplify: $(2x-3)^2$

OR

Solution:

$$(2x-3)(2x-3)$$
$$= 4x^2 - 6x - 6x + 9$$
$$= 4x^2 - 12x + 9$$

$(2x-3)^2$

$-6x$ x2

$= 4x^2 \quad -12x \quad +9$

Example 4.2

Simplify: $-1(2x+5)^2$

OR

Solution: $-1(2x+5)(2x+5)$

$$= -1(4x^2 + 10x + 10x + 25)$$
$$= -1(4x^2 + 20x + 25)$$
$$= -4x^2 - 20x - 25$$

$(2x+5)^2$

$+10x$ x2

$= 4x^2 \quad +20x \quad +25$

Try this:

$(3x+4)^2$

$-2(2y-5)^2$

Exercise 1.1

Simplify:

1)	$2x(x-3)$	2)	$-5x(x^2-2x+3)$
3)	$3xy(3x^2y+2xy^2-4)$	4)	$-2a^2b(2a^2-b+3)$
5)	$-(x-7)$	6)	$2x(x+7)-(x-10)$
7)	$(y+5)(y+2)$	8)	$(y+5)(y-5)$
9)	$(y+5)^2$	10)	$(3-k)(1-2k)$
11)	$(x-3)(x+3)$	12)	$(2m+8)(3m+1)$
13)	$(3c-2)(c+6)$	14)	$(p+7)^2$
15)	$-(4-x)(4+x)$	16)	$(5k-1)(5k+1)$
17)	$(6y+2)(1-y)$	18)	$(1-5y)^2$
19)	$-(-3-x)(5-x)$	20)	$(7-x)(7+x)$
21)	$(10+k)^2$	22)	$y(y+2)+(y+5)(y-1)$
23)	$x(x-1)-(x+2)(x-3)$		

Exercise 1. 2

Simplify:

1) $(x-1)(x+1)$

2) $(y+3)(y-3)$

3) $(p+4)(p-4)$

4) $(k+3)(k-3)$

5) $(7-x)(7+x)$

6) $(2-y)(y+2)$

7) $(3y+1)(3y-1)$

8) $(2x+5)(2x-5)$

9) $(3m-2)(3m+2)$

10) $(5x+1)(5x-1)$

11) $-(10x-3)(10x+3)$

12) $(m-\frac{1}{2})(m+\frac{1}{2})$

13) $(x-\frac{1}{x})(x+\frac{1}{x})$

14) $3(y+2)-(y-5)(y+5)$

15) $-(3-x)(3+x)+9(x-\frac{1}{3})(x+\frac{1}{3})$

16) $(5k-1)(5k+1)$

Exercise 1.3

Simplify:

1)	$(x+1)^2$	2)	$(y-3)^2$
3)	$(p-4)^2$	4)	$(k+3)^2$
5)	$(x-7)^2$	6)	$(7-x)^2$
7)	$(3y+1)^2$	8)	$(2x-3)^2$
9)	$(3y-4)^2$	10)	$2(x+1)^2$
11)	$-3(2y-5)^2$	12)	$(2-3m)^2$
13)	$y(y+2)+\ (y-5)^2$	14)	$(x-1)(x+1)-\ (x+3)^2$
15)	$-(3-x)^2+(x-3)^2$	16)	$(m+\frac{1}{2})^2$
17)	$(x-\frac{1}{x})^2$	18)	$(x+\frac{1}{x})^2-2$
15)	$(a+b)^2$	16)	$(a-b)^2$

MORE PRODUCTS: EXAMPLES

1 term x 2 term

1. $x(x-2)$
$= x^2 - 2x$

1 term x 3 term

2. $\frac{1}{2}(x+2y-4)$
$= \frac{1}{2}x^2 + y - 2$

2 term x 2 term

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

4. $(3a-2b)(3a+2b)$
$= 9a^2 - 4b^2$

2 term x 3term

5. $(3a-2)(a^2 - a + 4)$
$= 3a^3 - 3a^2 + 12a - 2a^2 + 2a - 8$
$= 3a^3 - 5a^2 + 14a - 8$

6. $(3a-2)(9a^2 + 6a + 4)$
$= 27a^3 - 8$

7. $(x+4y)(x^2 - 4xy + 16y^2)$
$= x^3 + 64y^3$

EXERCISE 1.4

Simplify:

1) $2(p-4)-(p^2+3p-6)$

2) $x(3x-5)-(2x+3)(2x-3)$

3) $(3x-5)(2x+3)$

4) $(x-3)(x^2+9)(x+3)$

5) $(x^5-5)(x^5+5)$

6) $(3x-2)^2$

7) $(4x-3)(4x+3)$

8) $(a-3b)^2$

9) $(x+1)(x^2+2x-3)$

10) $(k^2+3)(k^4-3k^2+9)(x^6-27)$

11) $(x-2)(x^2-2x+4)$

12) $(p-2)(p^2+2p+4)$

13) $(y+3)(y^2-3y+9)$

14) $(10m-2)(100m^2+20x+4)$

15) $(4x+3y)(16x^2-12xy+9y^2)$

2. FACTORISATION

NOTE

&

But

GROUPING

5.

(

6.

7. 4

= 4

=

=

8. 4

Difference between two squares

9.

10.

11. 2

=
=

12.

13.

Always look for a common factor!

$(a-3)^2 - 4$
$= [(a-3) +2][(a-3) -2]$
$= [a-1][a-5]$

Trinomial

First write in descending order of

Method:

15.

....common fact

ADD

Method:

SUBTRACT

Sum and difference of cubes:

17.

18. 27

=

19.

The exponents must be divisible by three

Nice to know

1x1x1 = 1
2x2x2 = 8
3x3x3 = 27
4x4x4 = 64
5x5x5 = 125
6x6x6 = 216

= a
= a^2
=
=

EXERCISES 2

3. ALGEBRAIC FRACTIONS

REMEMBER:

Fractions x and

Fractions simplify

Factorise
Cancel

Fractions + a

LCM



Fractions x and

=

=

=

Fractions Simplify:

= 3x

Fractions: + and

5.

=

6.

=

=

7. = =

EXERCISE 3

LCD

Factorise first then cancel

Gemeng

(

=

Iets anders:

As bepaal die waarde van :

OPLOSSING

+ 2 + = 25

+ = 23

4. EXPONENTS

EXPONENT LAWS

Note:

Direct application of laws

1.

2.

3. 5

(5

5.

Prime numbers

= 1 .
=

= 1 .
=
(3a-2b)(3a+2b)
= $9a^2 - 4b^2$

(
=

(

–

6.

Factorise

Equations

Unknown in Exponent

7.

8. 5.

9.

10.

Equations

Unknown in Base

11.

12.

NOTE:

Exercise 4.1

Simplify:

1. [

Exercise 4.2

Solve for

1.