

# iMathematika

AMALUNGISELELO EMVIWO NEMVAVANYO

Anne Eadie, Gretel Lampe & Tracy Howie

GREYIDI

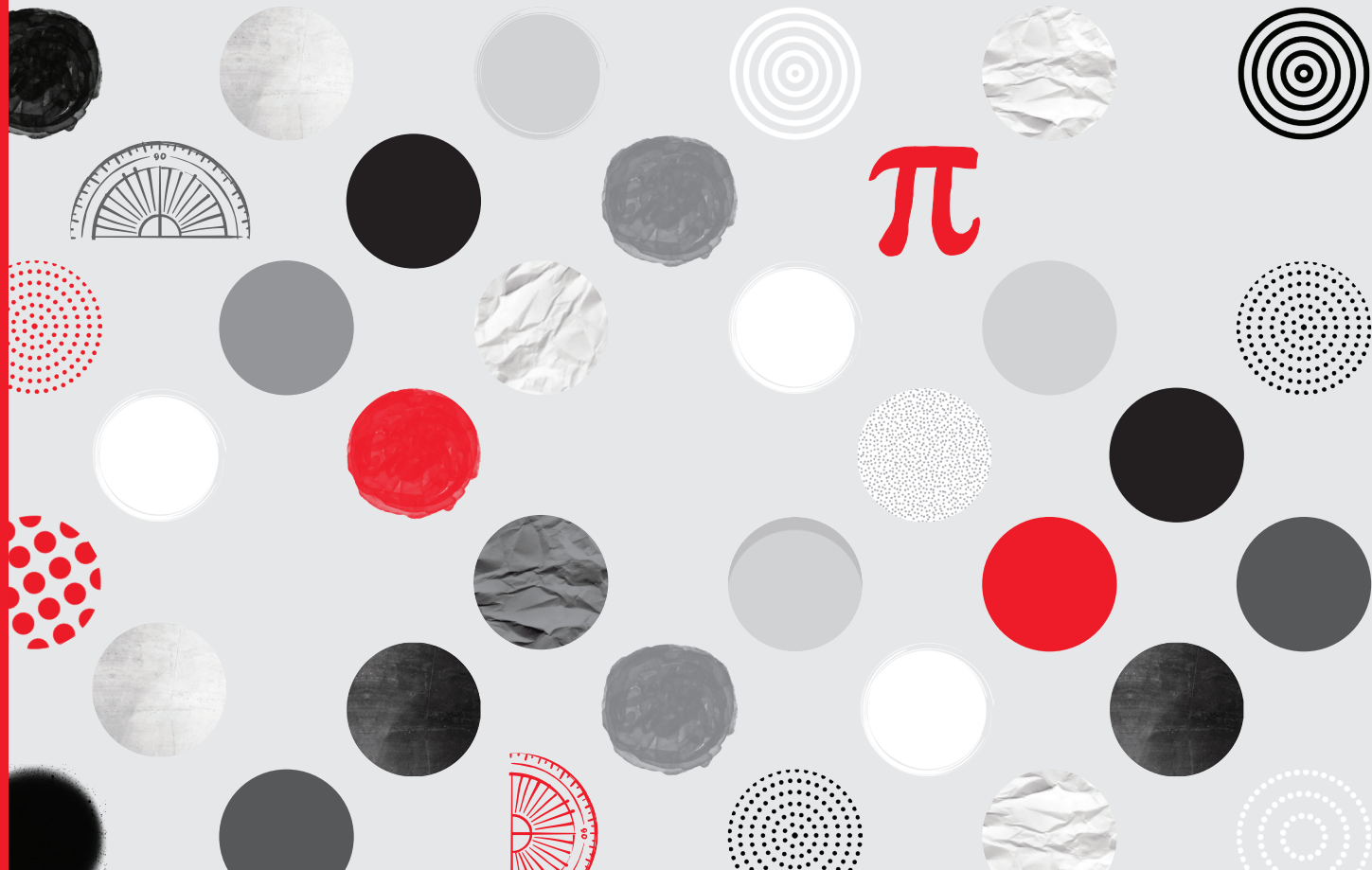
8

CAPS

2-in-1



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# Grade 8 **Mathematics** 2-in-1 CAPS

## TEST & EXAM PREPARATION

The Answer Series Grade 8 Maths 2-in-1 study guide walks you through the fundamentals of critical concepts such as algebra and geometry, helping you to build a thorough understanding of every topic. With this strong foundation, your logic and mathematical reasoning will develop profoundly.

### **This 2-in-1 publication includes:**

- Topic-based graded questions and full answers – to develop a step-by-step, thorough understanding of theory, techniques and concepts in every topic.
- Exam papers with full, detailed solutions.

### **Key features:**

- Step by step, methodical approach
- Comprehensive answers, explanations and advice boxes
- Exam Papers with detailed memos – to put theory into practice and reinforce concepts in an exam format.

This Grade 8 Maths study guide is highly beneficial for learners of all levels and builds a strong base for future mathematical development.

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# iMathematika

Ababhali: Anne Eadie, Gretel Lampe & Tracy Howie

Umguquleli esiXhoseni: Bongani Sopam

## ESI SIKHOKELO SOKUFUNDA SIQUKA

1 Imibuzo ngokweziHloko

2 Amaphepha eeMviwo

*Kukho iimpendulo ezinabileyo zala macandelo omabini*

Incwadi ye eBook  
ikwakhona 



# ISIQULATHO

## IMIBUZO ESEKWE KWIZIHLOKO

### IKOTA 1

INDAWO  
YOMXHOLO  
1

	Imibuzo	Iimpendulo
1 Amanani azi-Whole	1	A1
2 ii-Intheja	13	A17
3 ii-Exponenti	16	A21

INDAWO  
YOMXHOLO  
2

4 iiPhatheni zeNyumerik neJiyometri	19	A25
5 iiFankshini & uNxulumano (Isigaba 1)	21	A27
6 ii-Expreshini ze-Aljibra (Isigaba 1)	23	A29
7 ii-Ikhwezhini ze-Aljibra (Intshayelelo)	25	A32

### IKOTA 2

INDAWO  
YOMXHOLO  
2

8 ii-Expreshini ze-Aljibra (Isigaba 2)	26	A33
9 ii-Ikhwezhini ze-Aljibra (Isigaba 1)	29	A36

INDAWO  
YOMXHOLO  
3

10 Ulwakhiwo Lwemizobo yeJiyometri	30	A38
11 iJiyometri yoBume be 2D	35	A47
12 iJiyometri yeMigca eStreyti	41	A52

### IKOTA 3

Imibuzo Iimpendulo

INDAWO  
YOMXHOLO  
1

13 Amaqhezu aQhelekileyo	45	A55
14 Amaqhezu eDesimali & iPesenti	47	A60

INDAWO  
YOMXHOLO  
4

15 iThiyoremu kaPythagoras	49	A63
16 i-Eriya & iPerimitha yoBume be 2D	51	A65
17 iVolumu & iTotali ye-Eriya yoMphandle wezinto eziyi 3D	54	A69

INDAWO  
YOMXHOLO  
5

18 Ukusebenza ngeData	57	A72
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### IKOTA 4

INDAWO  
YOMXHOLO  
2

19 iiFankshini & uNxulumano (Isigaba 2)	66	A81
20 ii-Ikhwezhini ze-Aljibra (Isigaba 2)	68	A84

21 ii-Grafu	69	A87
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INDAWO  
YOMXHOLO  
3

22 iJiyometri yoGuqulo	75	A91
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23 iJiyometri yeZinto ezi 3D	78	A94
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INDAWO  
YOMXHOLO  
5

24 iProbbahlilithi	81	A95
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**Amaphepha Woviwo  
Iimemo Zeemviwo**

**... iPhepha E1  
... iPhepha M1**

# Isicwangciso Sokufundisa Esilungisiweyo (ATP)

## ATP

### IKOTA 1 *(Uhlaziyo luka Greyidi 7)*

Amanani azi-Whole

ii-Intheja

Amaqhezu aQhelekileyo

Amaqhezu eDesimali

### IKOTA 2

Amaqhezu eDesimali

ii-Exponenti

iiPhatheni zeNyumerik neJiyometrik

iiFankshini & Unxulumano

ii-Expreshini ze-Aljibra

## TAS/CAPS

1 Amanani azi-Whole

2 ii-Intheja

3 ii-Exponenti

4 iiPhatheni zeNyumerik neJiyometrik

5 iiFankshini & uNxulumano (Isigaba 1)

6 ii-Expreshini ze-Aljibra (Isigaba 1)

7 ii-Ikhwezhini ze-Aljibra (Intshayelelo)

8 ii-Expreshini ze-Aljibra (Isigaba 2)

9 ii-Ikhwezhini ze-Aljibra (Isigaba 1)

10 Ulwakhiwo Lwemizobo yeJiyometri

11 iJiyometri yoBume be 2D

12 iJiyometri yeMigca eStreyti

## ATP

### IKOTA 3

ii-Expreshini ze-Aljibra

ii-Ikhwezhini ze-Aljibra

iJiyometri yeMigca eStreyti

iJiyometri yoBume be 2D

### IKOTA 4

ii-Grafu

iJiyometri yoGuqulo

iThiyoremu kaPythagoras

i-Eriya & iPerimitha yoBume be 2D

## TAS/CAPS

13 Amaqhezu aQhelekileyo

14 Amaqhezu eDesimali & iPesenti

15 iThiyoremu kaPythagoras

16 i-Eriya & iPerimitha yoBume be 2D

17 iVolumu & iTotali ye-Eriya yoMphandle wezinto eziyi 3D

18 Ukusebenza ngeData

19 iiFankshini & uNxulumano (Isigaba 2)

20 ii-Ikhwezhini ze-Aljibra (Isigaba 2)

21 ii-Grafu

22 iJiyometri yoGuqulo

23 iJiyometri yeZinto ezi 3D

24 iProbhabhiliti

# IKOTA 2: IMIBUZO

## 8 ii-EXPRESHINI ze-ALJIBRA (Isigaba 2)

iSamu	→ +	... Dibanisa
uMahluko	→ -	... Thabatha
iProdakti	→ x	... Phindaphinda
iKhoshiyenti	→ ÷	... Hlulahlula



### Ulwimi lwe-Aljibra

#### Umsebenzi 8.1

*Iimpendulo ziku ph. A33*

1. Bhala ii-expresshini ze-aljibra ngezi zitetimente zilandelayo, wenze inani elingekaziwa libe ngu  $x$ .

*Ii-expresshini ze-aljibra zingasetyenziswa ukuguqula amabali engxaki zobalo zibe yiMathematika.*

- 1.1 i**Samu** yenani elingekaziwa kunye no 7. (1)
- 1.2 i**Prodakti** yenani elingekaziwa kunye no 3. (1)
- 1.3 u**Mahluko** phakathi kwenani elingekaziwa kunye no 8. (1)
- 1.4 Kwandiswe ngesibini kwinani eliphindwe kabini. (2)
- 1.5 i**Khoshiyenti** yenani elingekaziwa kunye nesikwere sika 5. (2)
- 1.6 i**Samu** yenani elingekaziwa kunye no 5, ize iphindaphindwe ngo 2. (2)
- 1.7 Phinda kabini i**samu** yenani elingekaziwa kunye no  $y$ . (2)

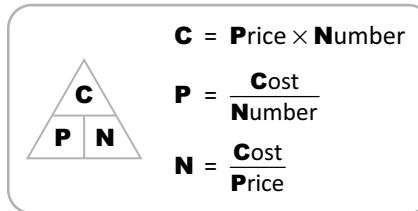
- 1.8 u**Mahluko** phakathi kwesikwere senani elingekaziwa kunye neloo nani liphindwe kabini. (2)
- 1.9 u**Mahluko** phakathi kwenani elingekaziwa kunye no 7, waze wahlulahlulwa ngeskweruthi salo kwalona elo nani lingekaziwa. (2)
- 1.10 i**Prodakti** yenani elingekaziwa kunye no  $y$ , yehliswe ngo 15. (2)

2. Nika ii-expresshini zoku kulandelayo wandule usimplifaye apho kungakwazi ukwenzeka khona:

#### iXesha (iMizuzwana, iMizuzu, iiYure)

- 2.1 Inani lemizuzu kwiiyure ezi 3 ezinemizuzu eyi 20. (2)
- 2.2 Inani lemizuzwana ekwimizuzu eyi p nemizuzwana eyi 16. (2)

#### Indleko



- 2.3 Ixabiso eliya kubhatalelwa iihempe ezi 4 ngumthengi xa zibiza R80 inye. (2)
- 2.4 Ixabiso eliya kubhatalelwa iijean ezimbini ngumthengi ukuba ibiza  $m$  yeerandi xa kukho nesaphulelo se  $n$  yeerandi inye. (2)
- 2.5 Ixabiso eliya kubhatalelwa ngumthengi xa into ibiza R100 kwaye inesaphulelo se R20 inye. (2)

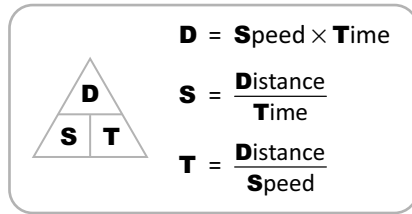
- 2.6 Ixabiso eliya kubhatalelwa ngumthengi kwii-jean eziyi 5 ezibiza  $x$  yeeRandi inye, kube kunesaphulelo se R10 inye. (2)
- 2.7 Ixabiso elibhatalelwe ibhanana enye ukuba i R20 ibhatalelwe ibhegi yeebhanana eziyi 10. (2)
- 2.8 Ixabiso elibhatalelwe i-apile lilinye ukuba ngaba i  $p$  yeerandi ibhatalelwe ibhegi yama-apile ayi  $q$ . (2)

#### iiNyanga neMinyaka

- 2.9 Inani leenyanga ezikwiminyaka eyi 8 eneenyanga ezi 5. (2)
- 2.10 Inani leenyanga ezikwiminyaka eyi  $t$  kunye neenyanga ezi  $p$ . (2)

#### Iminyaka yokukhula

- 2.11 Umyeni mdala ngaphezulu ngeminyaka eyi 4 kunenkosikazi yakhe yena one 45 yeminyaka ubudala. (2)
- 2.12 Utata mdala ngaphezulu ngeminyaka eyi 28 kunonyana wakhe, yena one  $x$  yeminyaka ubudala. (2)
- 2.13 Udadewabo wenkwenkwe uyiphinda kabini iminyaka yayo. Ukuba ineminyaka eyi 4 ubudala, mdala kangaka udadewayo? (2)
- 2.14 Inkwenkwe iyiphinda kabini iminyaka yomntakwayo yena one  $x$  yeminyaka ubudala. (2)
- 2.15 Iminyaka yomntu kwiminyaka eyi 5 edlulileyo yena oneminyaka eyi  $r$  ubudala ngoku. (2)
- 2.16 Intombi indala ngokuphindwe kabini kunomntakwabo. Yena umntakwabo uneminyaka eyi  $x$  ubudala. Bhala phantsi:  
 (a) iminyaka yentombi  
 (b) iminyaka yomntakwayo kwiminyaka eyi 5 edlulileyo  
 (c) iminyaka yentombi kwiminyaka eyi 5 edlulileyo (3)



### iSantya, uMgama, iXesha

- 2.17 Umgama ohanjwa yimoto ngeeyure eziyi 1,5 ukuba ihamba ngo 100 km/h. (2)
- 2.18 Umgama ohanjwa yimoto ngeeyure eziyi  $x$  ukuba ihamba ngo  $y$  km/h. (2)
- 2.19 Isantya imoto ehamba ngaso ukuba ihamba umgama we  $m$  km ngeeyure eziyi  $n$ . (2)
- 2.20 Kuya kuyithatha ixesha elingakanani Imoto ukuhamba i  $s$  km ukuba ihamba ngo  $v$  km/h. (2)

### iReyathi

- 2.21 Isixa semali osifumanayo ukuba uhlawulwa i R20 ngeyure uze ube usebenze iiyure eziyi 6. (2)
- 2.22 Isixa semali osifumanayo ukuba uhlawulwa R $x$  ngeyure ube usebenze iiyure eziyi  $y$ . (2)
- 2.23 Kuthatha umntu omnye iintsuku eziyi 12 ukwakha udonga. Kuya kubathatha iintsuku ezingaphi abantu abayi 2 ukwakha kwalona olo donga lunye? (2)
- 2.24 (a) Umchwethezi (typist) angachwetheza uxwebhu ngeeyure eziyi 5. Kuya kubathatha iiyure ezingaphi abachwethezi ababini ukuchwetheza kwalona elo xwebhu linye besebenza kunye? (1)
- (b) Umchwethezi angachwetheza uxwebhu ngeeyure eziyi  $x$ . Bhala i-expresshini emele ixesha elinokuthathwa ngabachwethezi abayi 3 ukuchwetheza kwalona olo xwebhu lunye besebenza kunye. (1)



## UkuSimplifaya ii-Expresshini ze-Aljibra



### Umsebenzi 8.2

*Iimpendulo ziku ph. A33*

1. Ukuba  $A = 3x^2 + 5x - 2$ ;  $B = -2x - x^2 + 7$ ;  $C = -5 + 2x^2 + x$  funa ufumane oku kulandelayo:
- 1.1  $A + C$                       1.2  $C - B$                       (3)(4)
- 1.3 iprodakti ka  $A$  no  $-2$                       (3)
2. Qaphela ezi expresshini zilandelayo:
- A:  $3x^2 - 2 + 4x$   
 B:  $2x - 6x^2 + 5x^2$   
 C:  $4 - 2x^2 + 3x$
- 2.1 Funa ufumane i-value ka  $A + B + C$                       (4)
- 2.2 Funa ufumane u  $-3A$                       (3)
- 3.1 Thabatha  $3x^2 - 2x - 7$  ku  $4x^2 - 2x - 6$ .                      (3)
- 3.2 Ku  $5 - 7y + y^2$ , thabatha  $11 + 7y - 5y^2$ .                      (3)
4. Funa ufumane oku kulandelayo:
- 4.1 Hlulahlula  $8x^5y^4 - 12x^2y^3 + 24x^4y^5$  ngo  $-4x^2y^3$                       (3)
- 4.2 Phindaphinda  $3x^2y - 2xy^2$  ngo  $-x^3y$                       (2)
- 4.3 Hlulahlula  $-16a^3b^2 + 24ab - 8b^3$  ngo  $-8ab$                       (3)
- 4.4 Ukuba  $A = (2x - y)$ ,  $B = 2$  no  $C = (x + 3y)$ , fumana uze usimplifaye  $AB - C$ .                      (4)
5. Unikwe  $P = 3m^2 - mn$  kunye no  $Q = m^2 - 2mn$ , fumana
- 5.1  $P - 3Q$  ngokuka  $m$  no  $n$ . (3)
- 5.2  $x$ , ukuba  $x = 3(P - 3Q)$  aze  $m = -1$  no  $n = 2$ . (5)

## Ukuqunjelwa kwee-expresshini ze-Aljibra

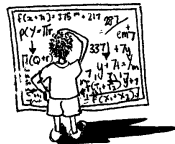
### Umsebenzi 8.3

*Iimpendulo ziku ph. A34*

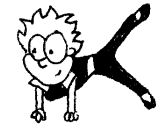
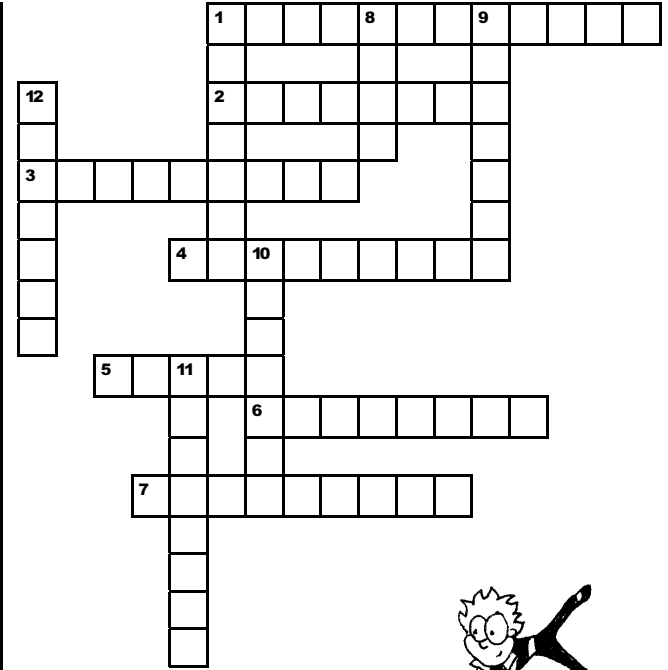
Simplifaya oku kulandelayo:

1.  $3 \times a \times b$                       (1)
2.  $5p \times -3q$                       (1)
3.  $-(-3x)(-2x)$                       (2)
4.  $x^7 \cdot x \cdot x^2$                       (2)
5.  $7y^3z^4 \times 3y^3z$                       (2)
6.  $(4m^8)^2 \div 8m^{10}$                       (3)
7.  $4x^5y^4 \div (-2xy^3)$                       (3)
8.  $(a \times a \times a)^2 - 2(a \times a)^3$                       (3)
9.  $[-(2pq)^2]^3$                       (3)
10.  $(-2x^2)^3 \div 2$                       (3)
11.  $3 \times (a + b)$                       (2)
12.  $3x(x + 5)$                       (2)
13.  $-4x(x + 2y)$                       (2)
14.  $2p^2 - 3pq + 2qp - 2p$                       (2)
15.  $-7c - (-5c)$                       (3)
16.  $7 - m \times 3 + 7m$                       (3)
17.  $5a - 4(a + 1)$                       (2)
18.  $2ab + 2a(b + 3)$                       (2)
19.  $5(3m - 4n + 1)$                       (3)
20.  $-3mn(m^3 - m^2n + n^5)$                       (3)

21.  $3x^2y(2xy^3 - 5xy^2 + xy)$
22.  $+2a^2bc^3(2ab^2c + 2^2a^2bc^2 - 2^3abc)$
23.  $(14x^3 - 21x) \div 7x$
24.  $5 - 2(x + y) - (2y - 2x)$
25.  $-3(2y - 3x) - 2(x + y)$
26.  $-2(y - x)(-2) - (x - 3) - y$
27.  $4ab^2 - 3b^2a + 2a \times (-3b)b - 2a$
28.  $\frac{15p - 10q + 5pq}{5}$
29.  $\frac{28m - 20mn}{4}$
30.  $\frac{5a^2b - ab^3}{ab}$
31.  $\frac{15a - 21}{-3a}$
32.  $\frac{y^2 + y - 7y - 18y^3 + 11y^2}{6y}$
33.  $x^2 \times x^0 + 2x - 2x^2$
34.  $(-48t^4s - 12t^2s^5) \div (12ts)$
35.  $\frac{(2 + 3)(x^2 + 3)}{15}$
36.  $[(7y \times x)^2 + 7x^2y^2] \div 4xy^2$
37.  $\sqrt{49x^{22}y^{16}}$
38.  $\sqrt{25x^2 - 9x^2} \div 4x$
39.  $\sqrt[3]{(8d^3)^2} - 3d(d + 2)$
40.  $\frac{12x \times 0}{3}$



- (3) **I-puzzle yokonwaba** *Iimpendulo ziku ph. A35*
- (3) Funda imibuzo wandule uzalise i-crossword puzzle.
- (3) **Ezinqumlayo (zalisa ngamagama esiNgesi)**
1.  $2(x + y) = 2x + 2y$  ubonisa umthetho wepropati ye \_\_\_\_\_ .
  - (3) 2. Kwi-expresshini ye-aljibra u  $x$  ubizwa ngokuba yi \_\_\_\_\_ .
  - (3) 3.  $\{4; 6; 8; 9; 10; 12; 14; 15\}$  ngamanani abizwa \_\_\_\_\_ numbers ukusuka ku 1 ukuya ku 15.
  - (3) 4. I-expresshini ye-aljibra enee-termu ezintathu ibizwa ngokuba yi \_\_\_\_\_ .
  - (3) 5. Inani elinokwahlulahlulwa ngalo nesinye kuphela libizwa ngokuba yi \_\_\_\_\_ number.
  - (3) 6. Inani elinokubhalwa kwimo engu  $\frac{a}{b}$  apho khona u a no b bazi-intheja liyi \_\_\_\_\_ number.
  - (4) 7.  $\frac{5 + 2 \times 6}{0}$  ungu \_\_\_\_\_ .
- (2) **Ezihlayo (zalisa ngamagama esiNgesi)**
- (3) 1. Inani owahlulahlula ngalo ukuze ufumane ikhoshiyenti yi \_\_\_\_\_ .
  - (3) 8.  $Q \cup Q' =$  yiseti yamanani azi \_\_\_\_\_ numbers.
- $Q =$  iseti yamanani azirashinali  
 $Q' =$  iseti yamanani azi-irashinali
- (2) 9. Nawaphi na amaqhezu angengomaqhezu alinganayo azi \_\_\_\_\_ .
  - (3) 10.  $\frac{1}{5}$  yi- multiplicative \_\_\_\_\_ ka 5.
  - (4) 11. 0 yi \_\_\_\_\_ elementi kudityaniso.
  - (2) 12.  $\{1; 2; 3; 6\}$  zii \_\_\_\_\_ zika 6.

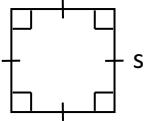
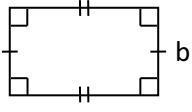
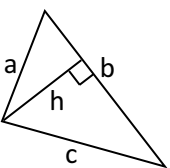
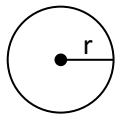



**UKUPHAWULA**





# 16 i-ERIYA & iPERIMITHA YOBUME BE 2D: ii-FORMULA

Ubume Obuyi 2D	iPerimitha (P)	i-Eriya (A)
	Isamu yamacala akwibhawundri engaphandle zobume obuyi 2D.	Ingingqi evalelewe ngamacala aziibhawundri zobume obuyi 2D.
<b>iSikwere</b> s = side (icala) 	iPerimitha = $4 \times \text{side}$ $\therefore P = 4s$	i-Eriya = $\text{side} \times \text{side}$ $= (\text{side})^2$ $\therefore A = s^2$
<b>iRektengile</b>  l = length (ubude) b = breadth (ububanzi)	iPerimitha = $(2 \times \text{length}) + (2 \times \text{breadth})$ $\therefore P = 2l + 2b$ $= 2(l + b)$	i-Eriya = $\text{length} \times \text{breadth}$ $\therefore A = l \times b$
<b>iTri-engile</b>  a = side <sub>1</sub> b = i-base c = side <sub>2</sub> h = ⊥ height	iPerimitha = $\text{side}_1 + \text{base} + \text{side}_2$ $\therefore P = a + b + c$	i-Eriya = $\frac{1}{2} \text{base} \times \perp h$ $\therefore A = \frac{1}{2} b \times \perp h$ OKANYE i-Eriya = $\frac{\text{base} \times \text{height}}{2}$ $\therefore A = \frac{b \times h}{2}$
<b>iSekile</b>  r = irediyasi d = idayamitha = 2r	iSekhamferensi = $2 \times \pi \times \text{irediyasi}$ OKANYE = $\pi \times \text{idayamitha}$ (apho u $\pi = \frac{22}{7}$ okanye 3,14) $\therefore C = 2\pi r$ OKANYE $C = \pi d$	i-Eriya = $\pi \times (\text{rediyasi})^2$ $\therefore A = \pi r^2$ 

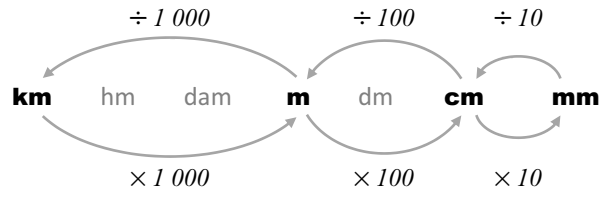
## iiYunithi ze-SI & Inguqulelo-yunithi

*iYunithi eNcinci* → *iyunithi enkulu*: ÷

*iYunithi eNkulu* → *iyunithi encinci*: ×

### Iperimitha

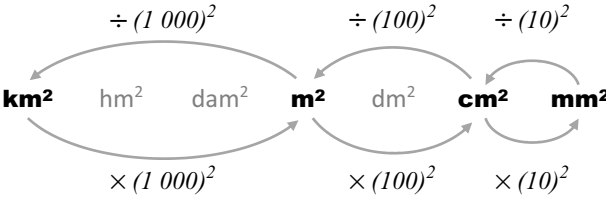
**hlulahlula** ←



**phindaphinda** →

### i-Eriya

**hlulahlula** ←



**phindaphinda** →

*Ngoba i-eriya iyiprodakti yamacala ayi 2D, kufuneka si × okanye ÷ nge (fektha yoguqulelo)².*

**Kubalo lwakho, soloko utshekisha ukuba iiyunithi ziyafana.**



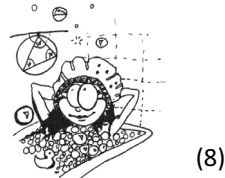
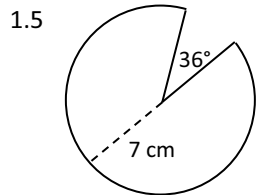
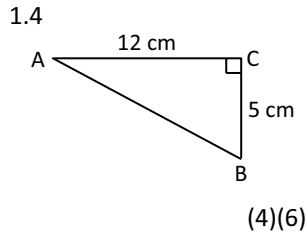
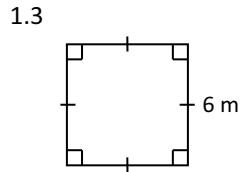
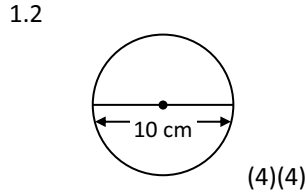
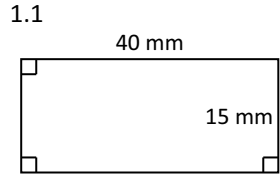
**i-Eriya nePerimitha**



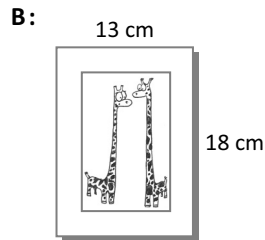
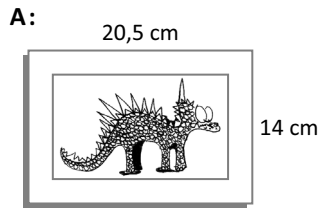
**Umsebenzi 16.1**

*Iimpendulo ziku ph. A65*

1. Funa i-eriya neperimitha yobume obulandelayo:



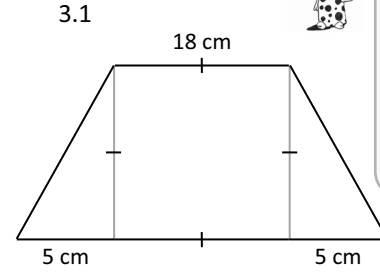
2. Le mifanekiso ilandelayo yomibini ineefreyimu ezinobubanzi obuyi 2 cm:



2.1 Yeyiphi ifreyimu eneyona perimitha encinane? (4)

2.2 Ngowuphi umfanekiso oneyona eriya inkulu? (6)

3. Khaltyhuleyitha iperimitha ne-eriya yobu bume bulandelayo:

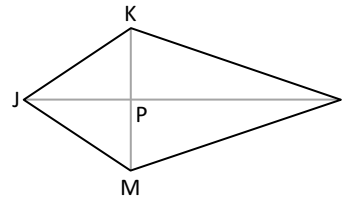


*Qala ukhaltyhuleyithe ngeyunithi enikiweyo (umz. cm) uze ke uguqulele kwiyunithi oyibuziweyo (umz. mm<sup>2</sup>) kwimpendulo yakho ekugqibeleni.*

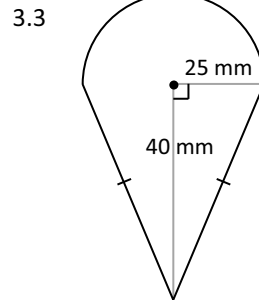
Nika iimpendulo zakho zibe kwi mm kunye ne mm<sup>2</sup>. (10)

3.2 I-Kite u JKLM unezi dayimenshini zilandelayo:

- ▶ JK = 2 cm
- ▶ LM = 3,5 cm
- ▶ KM = 3 cm
- ▶ JL = 4,5 cm



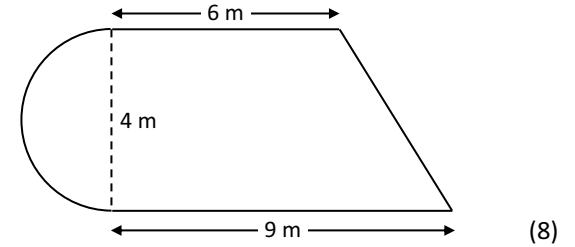
(8)



Nika impendulo yakho Ibe kwi cm kunye ne cm<sup>2</sup>. (12)

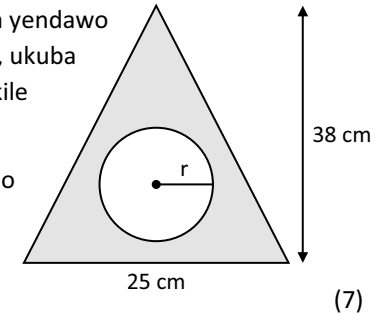


4. Isikolo sigqiba ekubeni kwakhiwe iqula lokuqubha elitsha. Ukuba iqula lokuqubha libiza R2 100/m<sup>2</sup>, kuya kusidla malini isikolo ukwakha eli qula lokuqubha?

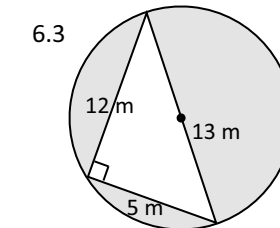
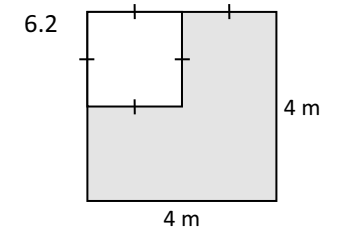
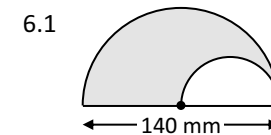


5. Funa ufumane i-eriya yendawo ehlikhlwe ngombala, ukuba ngaba irediyasi yesekile ingu 9 cm.

Nika impendulo yakho ibe kwi mm<sup>2</sup>.



6. Khaltyhuleyitha i-eriya yeendawo ezihlikhlwe ngombala kobu bume bungezantsi:



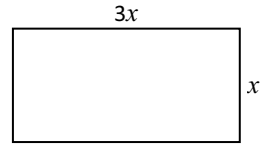
# Ukusombulula iingxaki-zobalo kusetyenziswa i-Eriya nePerimitha



## Umsebenzi 16.2

Iimpendulo ziku ph. A67

1. I-eriya yerektengile esecaleni apha ngu  $48 \text{ cm}^2$ .



Funa ufumane i-value ka  $x$ .

(4)

- 2.



Funa ubhale i-expresshini ye-aljibra yoku:

- 2.1 I-eriya yerektengile. (3)  
 2.2 Iperimitha yerektengile. (3)  
 2.3 Ukuba i-eriya yerektengile ingu  $60 \text{ cm}^2$ , funa i-value ka  $x$ . (4)

3. Ukuba i-eriya yeCompact Disc (CD) ngu  $10\,568 \text{ mm}^2$ , khaltyhuleyitha irediyasi ye CD. (Sukuwuhoya umngxunya osembindini.)

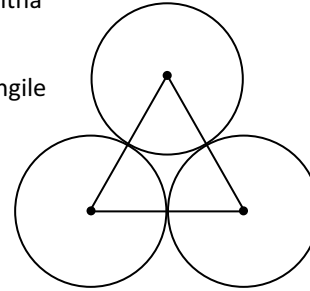


(4)

4. Isifazi sokunkcenceshela ngamanzi sijikeleza sithathe i-eriya engu  $12 \text{ m}^2$ . Kungafuneka ume kude kangakanani kwesi sifazi ukuba akufuni ukuba manzi? Finyenza impendulo yakho iye kweyona mitha ikufutshane. (6)

5. Idayagramu engezantsi ibonisa iisekile ezintathu, nganye kuzo inedayamitha engu  $12 \text{ cm}$ .

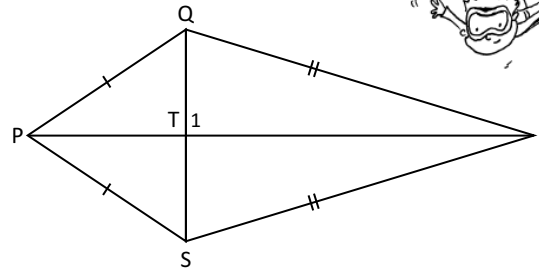
Iveteksi nganye yetri-engile ikwisenta yesekile.



Ithini iperimitha yale tri-engile?

(4)

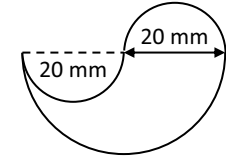
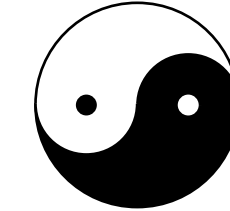
6. Unikwe ikhwadrilaterali PQRS:



Bhekisa ku ph. 37 (Umbz. 1.7) ukuhlaziya umqondo wakho!

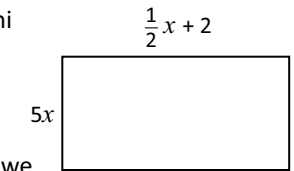
- 6.1 Nika igama lekhwadrilaterali PQRS, unike isizathu sempendulo yakho. (2)  
 6.2  $\hat{T}_1 = \underline{\hspace{2cm}}$   
 Nika isizathu sempendulo yakho. (2)  
 6.3 Ukuba u  $PT = 8 \text{ cm}$  aze u  $QS = 12 \text{ cm}$ , khaltyhuleyitha ubude buka PQ unike isizathu. (6)  
 6.4 Ngoku ke, ukuba  $TR = 2PT$ , khaltyhuleyitha iperimitha ka PQRS uyinike ibekwi cm ekufutshane. (4)  
 6.5 Khaltyhuleyitha i-eriya yekhwadrilaterali PQRS. (5)

7. Isimboli yeYin-Yang engezantsi apha yenziwe ngendawo emnyama nemhlophe. Indawo ebubume obumnyama, okwenyembezi, inikeziwe kwi-siketshi kwaye inemilinganiselo.



(8)

8. Idayagramu elapha ecaleni lmele irektengile. Iperimitha yale rektengile ngu  $37 \text{ cm}$ .



Ubude nobubanzi bunikeziwe kwidayagramu.

Ithini i-value ka  $x$  kwidayagramu?

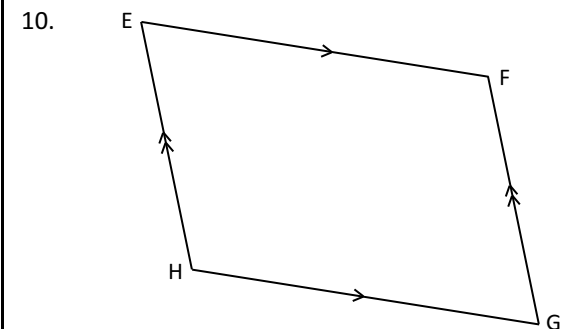
(6)

9. Irediyasi yevili lemoto ngu  $42 \text{ cm}$ .



Uthini umgama, ngeekhilomitha, onokuhanjwa yile moto emva kweerivolushini zemijikelezo egqibeleleyo yevili eyi 2 000?

(7)



$EF = 2EH$  (EF unobude obuphindwe kabini kobuka EH)

Ukuba iperimitha ka EFGH yi  $30 \text{ cm}$ , khaltyhuleyitha ubude buka FG. (Yenza u EH abe ngu  $x$ ) (6)

# IKOTA 2: IIMPENDULO

## 8 ii-EXPRESHINI ze-ALJIBRA (Isigaba 2)

ISamu	➔	+	... Dibanisa
Umahluko	➔	-	... Thabatha
Iprodakti	➔	x	... Phindaphinda
Ikhoshiyenti	➔	÷	... Hlulahlula



### Ulwimi lwe-Aljibra



#### Umsebenzi 8.1

*Imibuzo iku ph. 26*

- |                                  |                                   |
|----------------------------------|-----------------------------------|
| 1.1 $x + 7$                      | 1.2 $x \times 3 = 3x$             |
| 1.3 $x - 8$                      | 1.4 $2x + 2$                      |
| 1.5 $\left(\frac{x}{5}\right)^2$ | 1.6 $(x + 5) \times 2 = 2(x + 5)$ |
| 1.7 $2(x + y)$                   | 1.8 $x^2 - 2x$                    |
| 1.9 $\frac{x - 7}{\sqrt{x}}$     | 1.10 $x \times y - 15 = xy - 15$  |

#### iXesha (iMizuzwana, iMizuzu, iiYure)

- 2.1 inani lemizuzu =  $3 \times 60 + 20$   
 =  $180 + 20$   
 =  $200$  imizuzu
- Iyi 60 imizuzwana kumzuzu  
Iyi 60 imizuzu kwiyure*
- 2.2 inani lemizuzwana =  $p \times 60 + 16$   
 =  $(60p + 16)$  imizuzwana

#### Indleko

- 2.3 isixa =  $4 \times 80$   
 = R320
- 2.4  $2(m - n)$
- 2.5 isixa =  $100 - 20$   
 = R80
- 2.6  $5(x - 10)$  yerandi
- 2.7 ixabiso ngebhanana =  $\frac{20}{10}$   
 = R2 ngebhanana
- 2.8 ixabiso nge-apile =  $\frac{p}{q}$



#### iiNyanga neMinyaka

- 2.9 inani leenyanga =  $8 \times 12 + 5$   
 =  $96 + 5$   
 =  $101$  iinyanga
- 2.10 inani leenyanga =  $t \times 12 + p = 12t + p$

#### Iminyaka yokukhula

- 2.11 iminyaka yomyeni =  $45 + 4$   
 =  $49$  iminyaka
- 2.12 iminyaka katata =  $x + 28$
- 2.13 iminyaka yodadewabo =  $2 \times 4$   
 =  $8$  iminyaka
- 2.14 iminyaka yenkwenkwe =  $2 \times x$   
 =  $2x$  iminyaka
- 2.15 iminyaka yomntu kwiminyaka eyi 5 edlulileyo =  $(r - 5)$  iminyaka
- 2.16 (a)  $2x$  iminyaka  
 (b)  $(x - 5)$  iminyaka  
 (c)  $(2x - 5)$  iminyaka



#### Isantya, Umgama, Ixesha

- 2.17 Umgama =  $1,5 \times 100$   
 =  $150$  km
- 2.18 Umgama =  $x \times y$   
 =  $xy$  km
- 2.19 Isantya =  $\frac{m}{n}$  km/h
- 2.20 Ixesha =  $\frac{s}{v}$  iiyure

#### iReyithi

- 2.21 isixa esizuziweyo =  $20 \times 6$   
 = R120
- 2.22 isixa esizuziweyo =  $x \times y$   
 =  $Rxy$
- 2.23  $1 \times 12 = 12$   
 $\therefore 2 \times 6 = 12$



Kuya kuthatha abantu abayi 2 iintsuku eziyi 6 ukwakha olu donga lunye.  
 [Xa abantu bebaninzi, ixesha liba lincinci.]

- 2.24 (a)  $2\frac{1}{2}$  iiyure ...  $5 \div 2$  okanye  $\frac{5}{2}$   
 (b)  $\frac{x}{3}$  iiyure

### UkuSimplifaya ii-Expreshini ze-Aljibra



#### Umsebenzi 8.2

*Imibuzo iku ph. 27*

- 1.1  $A + C$   
 =  $(3x^2 + 5x - 2) + (-5 + 2x^2 + x)$   
 =  $3x^2 + 5x - 2 - 5 + 2x^2 + x$   
 =  $5x^2 + 6x - 7$
- 1.2  $C - B$   
 =  $(-5 + 2x^2 + x) - (-2x - x^2 + 7)$   
 =  $-5 + 2x^2 + x + 2x + x^2 - 7$   
 =  $3x^2 + 3x - 12$

1.3  $A \times -2$   
 $= -2A$   
 $= -2(3x^2 + 5x - 2)$   
 $= -6x^2 - 10x + 4$

2.1  $A + B + C$   
 $= (3x^2 - 2 + 4x) + (2x - 6x^2 + 5x^2) + (4 - 2x^2 + 3x)$   
 $= 3x^2 - 2 + 4x + 2x - 6x^2 + 5x^2 + 4 - 2x^2 + 3x$   
 $= 9x + 2$

2.2  $-3A = -3(3x^2 - 2 + 4x)$   
 $= -9x^2 - 12x + 6$

3.1 $4x^2 - 2x - 6$	3.2 $y^2 - 7y + 5$
$\frac{3x^2 - 2x - 7}{x^2 + 1}$	$\frac{-5y^2 + 7y + 11}{6y^2 - 14y - 6}$

4.1  $\frac{8x^5y^4 - 12x^2y^3 + 24x^4y^5}{-4x^2y^3}$   
 $= \frac{8x^5y^4}{-4x^2y^3} + \frac{-12x^2y^3}{-4x^2y^3} + \frac{24x^4y^5}{-4x^2y^3}$   
 $= -2x^3y + 3 - 6x^2y^2$

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

4.3  $\frac{-16a^3b^2 + 24ab - 8b^3}{-8ab}$   
 $= \frac{-16a^3b^2}{-8ab} + \frac{24ab}{-8ab} + \frac{-8b^3}{-8ab}$   
 $= 2a^2b - 3 + \frac{b^2}{a}$

4.4  $AB - C$   
 $= (2x - y) \times 2 - (x + 3y)$   
 $= 2(2x - y) - (x + 3y)$   
 $= 4x - 2y - x - 3y$   
 $= 3x - 5y$



5.1  $P - 3Q$   
 $= (3m^2 - mn) - 3(m^2 - 2mn)$   
 $= 3m^2 - mn - 3m^2 + 6mn$   
 $= 5mn$

5.2  $x = 3(P - 3Q)$   
 $= 3(5mn) \dots P - 3Q = 5mn$  *ivela Umbz. 5.1*  
 $= 15mn$   
 $= 15(-1)(2) \dots ukuba m = -1$  *aze n = 2*  
 $= -30$

**Ukuqukunjelwa kwee-expresshini ze-Aljibra**

**Umsebenzi 8.3**

*Imibuzo iku ph. 27*

- |                                                                        |                                                                                                        |
|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 1. $3 \times a \times b = 3ab$                                         | 2. $5p \times -3q = -15pq$                                                                             |
| 3. $-(-3x)(-2x) = -6x^2$                                               | 4. $x^7 \cdot x \cdot x^2 = x^{7+1+2} = x^{10}$                                                        |
| 5. $7y^3z^4 \times 3y^3z$<br>$= 21y^6z^5$                              | 6. $(4m^8)^2 \div 8m^{10}$<br>$= \frac{16m^{16}}{8m^{10}}$<br>$= 2m^6$                                 |
| 7. $4x^5y^4 \div (-2xy^3)$<br>$= \frac{4x^5y^4}{-2xy^3}$<br>$= -2x^4y$ | 8. $(a \times a \times a)^2 - 2(a \times a)^3$<br>$= (a^3)^2 - 2(a^2)^3$<br>$= a^6 - 2a^6$<br>$= -a^6$ |
| 9. $[-(2pq)^2]^3$<br>$= [-(4p^2q^2)]^3$<br>$= -64p^6q^6$               | 10. $(-2x^2)^3 \div 2$<br>$= \frac{-8x^6}{2}$<br>$= -4x^6$                                             |

11.  $3 \times (a + b)$   
 $= 3a + 3b$

12.  $3x(x + 5)$   
 $= 3x^2 + 15x$

13.  $-4x(x + 2y)$   
 $= -4x^2 - 8xy$

14.  $2p^2 - 3pq + 2qp - 2p$   
 $= 2p^2 - 3pq + 2pq - 2p$   
 $= 2p^2 - pq - 2p$

*umgaqo wekhomuthethivu:*  
 $p \times q = q \times p$

15.  $-7c - (-5c)$   
 $= -7c + 5c$   
 $= -2c$

16.  $7 - m \times 3 + 7m$   
 $= 7 - 3m + 7m$   
 $= 7 + 4m$

17.  $5a - 4(a + 1)$   
 $= 5a - 4a - 4$   
 $= a - 4$

18.  $2ab + 2a(b + 3)$   
 $= 2ab + 2ab + 6a$   
 $= 4ab + 6a$

19.  $5(3m - 4n + 1)$   
 $= 15m - 20n + 5$

20.  $-3mn(m^3 - m^2n + n^5)$   
 $= -3m^4n + 3m^3n^2 - 3mn^6$

21.  $3x^2y(2xy^3 - 5xy^2 + xy)$   
 $= 6x^3y^4 - 15x^3y^3 + 3x^3y^2$

22.  $+2a^2bc^3(2ab^2c + 2^2a^2bc^2 - 2^3abc)$   
 $= 4a^3b^3c^4 + 8a^4b^2c^5 - 16a^3b^2c^4$

23.  $\frac{14x^3 - 21x}{7x}$   
 $= \frac{14x^3}{7x} - \frac{21x}{7x}$   
 $= 2x^2 - 3$

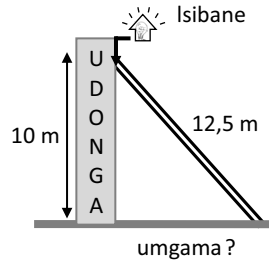




6.  $umgama^2 + 10^2 = 12,5^2$  ... *Pythagoras*

$$\begin{aligned} \therefore umgama^2 &= 12,5^2 - 10^2 \\ &= 156,25 - 100 \\ &= 56,25 \\ \therefore umgama &= \sqrt{56,25} \\ &= 7,5 \text{ m} \end{aligned}$$

$\therefore$  Ileli kuya kufuneka ibekwe 7,5 m ukusuka eludongeni.

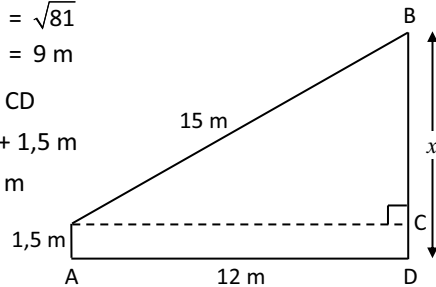


7.  $12^2 + BC^2 = 15^2$  ... *Pythagoras*

$$\begin{aligned} \therefore BC^2 &= 15^2 - 12^2 \\ &= 225 - 144 \\ &= 81 \\ \therefore BC &= \sqrt{81} \\ &= 9 \text{ m} \end{aligned}$$

$BD = BC + CD$

$$\begin{aligned} \therefore x &= 9 \text{ m} + 1,5 \text{ m} \\ &= 10,5 \text{ m} \end{aligned}$$



8.1 irektengile

8.2  $\hat{G} = \hat{H} = \hat{I} = 90^\circ$

8.3 yi-tri-engile ene right-engile

8.4  $GJ^2 + GH^2 = HJ^2$  ... *Pythagoras*

$$\begin{aligned} \therefore 10^2 + 24^2 &= HJ^2 \\ \therefore HJ^2 &= 10^2 + 24^2 \\ \therefore HJ^2 &= 100 + 576 \\ \therefore HJ^2 &= 676 \\ \therefore \sqrt{HJ^2} &= \sqrt{676} \\ \therefore HJ &= 26 \text{ cm} \end{aligned}$$



## 16 i-ERIYA & iPERIMITHA YOBUME BE 2D

### i-Eriya nePerimitha



#### Umsebenzi 16.1

*Imibuzo iku ph. 52*

1.1 I-eriya =  $\ell \times b$  & Iperimitha =  $2\ell + 2b$   
 $= 40 \text{ mm} \times 15 \text{ mm} = 2(40) + 2(15)$   
 $= 600 \text{ mm}^2 = 80 + 30 = 110 \text{ mm}$

1.2 idayamitha = 10 cm ;  $\therefore$  irediyasi = 5 cm

$$\begin{aligned} \therefore \text{I-eriya} &= \pi r^2 & \text{Iperimitha} &= 2\pi r \\ &= \pi(5)^2 & &= 2\pi(5) \\ &= 78,54 \text{ cm}^2 & &= 31,42 \text{ cm} \end{aligned}$$



OKANYE  $P = \pi d = \pi(10) = 31,42 \text{ cm}$

1.3 I-eriya =  $s^2$  & Iperimitha =  $4s$   
 $= (6)^2 = 4(6) = 36 \text{ m}^2 = 24 \text{ m}$

1.4 I-eriya =  $\frac{1}{2} b \times \perp h$  OKANYE I-eriya =  $\frac{b \times h}{2} = \frac{12 \times 5}{2} = 30$   
 $= \frac{1}{2} \times 12 \times 5 = 30 \text{ cm}^2$

$AB^2 = AC^2 + BC^2$  ... *Pythagoras*

$$\begin{aligned} AB^2 &= 12^2 + 5^2 \\ \therefore &= 144 + 25 \\ &= 169 \end{aligned}$$

$$\begin{aligned} AB &= \sqrt{169} \\ &= 13 \text{ cm} \end{aligned}$$

$$\begin{aligned} \therefore \text{Iperimitha} &= a + b + c \\ &= 12 + 5 + 13 \\ &= 30 \text{ cm} \end{aligned}$$



1.5 Iqhezu okanye isektha yesekile engekhooyo =  $\frac{36^\circ}{360^\circ} = \frac{1}{10}$

$$\therefore \text{Iqhezu lesekile} = \frac{10}{10} - \frac{1}{10} = \frac{9}{10}$$

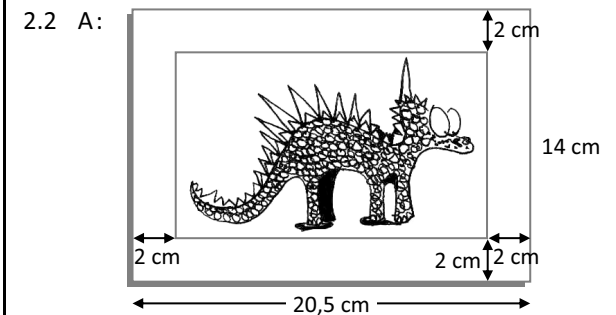
$$\begin{aligned} \therefore \text{I-eriya ye } \frac{9}{10} \text{ yesekile} &= \frac{9}{10} \times \pi r^2 \\ &= \frac{9}{10} \times \pi(7)^2 \\ &= 138,54 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Isekhamferensi ye } \frac{9}{10} \text{ yesekile} &= \frac{9}{10} \times 2\pi r \\ &= \frac{9}{10} \times 2\pi(7) \\ &= 39,58 \text{ cm} \end{aligned}$$

$$\begin{aligned} \therefore \text{iTotali yesekhamferensi yobume} &= \text{isekhamferensi ye } \frac{9}{10} \text{ yesekile} + 2 \times \text{irediyasi} \\ &= 39,58 + (2 \times 7) \\ &= 53,58 \text{ cm} \end{aligned}$$

2.1 Ifreyimu A:  $P = 2(\ell + b) = 2(20,5 + 14) = 69 \text{ cm}$   
 Ifreyimu B:  $P = 2(\ell + b) = 2(18 + 13) = 62 \text{ cm}$

$\therefore$  Ifreyimu B uneyona perimitha incinci.



$$\begin{aligned} \therefore \text{ubude bomfanekiso} &= 20,5 \text{ cm} - 2 \text{ cm} - 2 \text{ cm} = 16,5 \text{ cm} \\ \text{ububanzi bomfanekiso} &= 14 \text{ cm} - 2 \text{ cm} - 2 \text{ cm} = 10 \text{ cm} \end{aligned}$$

$$\begin{aligned} \therefore \text{I-eriya yomfanekiso} &= \ell \times b \\ &= 16,5 \text{ cm} \times 10 \text{ cm} \\ &= 165 \text{ cm}^2 \end{aligned}$$



**IPHEPHA E1**

1½ iiyure  
100 amanqaku

*Impendulo ziku ph. M13*

*Wonke umsebenzi wobalo oyimfuneko mawuboniswe kwindawo efanelekileyo kunye nempendulo.*

*Ikhaltyhuleyitha ayinakusetyenziswa kweli phepha. Iidayagramu azizotywanga ngokomlinganiselo ncam wesikali.*

**UMBUZO 1**

Gqibezela le theyibhule ingezantsi apha. Yenza uphawu lomkorekisho kwindawo ezichanekileyo ukuhlela uxele inani ngalinye.

	Natshurali	Intheja	Rashinali	Ir-Rashinali	Real	Imajinari
-3						
4π						
√-7						
√36						

[4]

**UMBUZO 2**

**Khumbula:**



- 2.1 Bhala phantsi eyona multipli esezantsi ekho-macala ka 10 no 12. (1)
- 2.2 Leliphi elikhulu: 13,2 okanye  $\sqrt{163}$ ? (Cacisa impendulo yakho.) (1)
- 2.3 Mangaphi amanani azi-whole aphakathi ko  $\sqrt{8}$  kunye no  $\sqrt{80}$ ? (1)
- 2.4 Qwalasela la manani: -7; -5; -1; 1; 3 Usebenzisa kuphela amabini kula manani angasentla, ithini eyona prodakti incinane ubani anokuthi ayenze? (1)
- 2.5 Bhala phantsi iifektha zika 18. (2)
- 2.6 Simplifaya  $\frac{10^7}{5 \times 10^4}$  (2)
- 2.7  $\diamond$  no  $\Delta$  ngamanani azinatshurali kwaye u  $\diamond \times \Delta = 36$ . Ithini i-value enkulu enokuba khona ka  $\diamond - \Delta$ ? (2) [10]

**UMBUZO 3**

- 3.1 Simplifaya:
  - 3.1.1  $1\frac{1}{2} + 3\frac{2}{3}$       3.1.2  $1\frac{5}{16} \div 2\frac{11}{12}$       (3)(3)
- 3.2  $n^2$  ithetha i-risiprokali ka n. Lilonke,  $5^2 = \frac{1}{5}$ , njengomzekelo. Zeziphi kwezi zilandelayo eziyinyani? Bhala phantsi unobumba/oonobumba abahambisana nezitetimente ezichanekileyo.
  - A  $3^2 + 6^2 = 9^2$
  - B  $6^2 - 4^2 = 2^2$
  - C  $2^2 \times 6^2 = 12^2$
  - D  $10^2 \div 5^2 = 2^2$       (2)[8]

**UMBUZO 4**

- 4.1 Ivenkile yezilwanyana zasekhaya ithengisa kuphela izinja, iikati kunye neempuku kwireshiyo ka 2 : 3 : 30. Ukuba ngaba kukho itotali yezilwanyana eziyi 385, zingaphi iikati kule venkile? (2)
- 4.2 UMatthew uqalise ukukera isiqhu seetapile eziyi 44 ngezinga leetapile eziyi 3 ngomzuzu. Emva kwemizuzu eyi 4 uCharles uye wamncedisa echuba ngezinga leetapile eziyi 5 ngomzuzu. Zingaphi iitapile ezikerwe nguCharles ekugqibeni kwabo? (3)
- 4.3 Ukuba  $\frac{x}{y} = \frac{2}{3}$  aze u  $\frac{y}{z} = \frac{7}{5}$  fumana i-value ka  $\frac{z}{x}$ . (3)[8]

**UMBUZO 5**

Unikwe:  $3x - 4x^2 + 2x^3 - 1$

- 5.1 Ithini i-degree yale expreshini? (1)
- 5.2 Ithini ikhofishenti ka  $x^3$ ? (1)
- 5.3 Bhala phantsi itermu eyikhonstenti. (1)
- 5.4 Ithini i-value yale expreshini ukuba  $x = 1$ ? (1)
- 5.5 Lungisa udwelise le expreshini ngee-power ezihlayo zika x. (1)[5]

**UMBUZO 6**

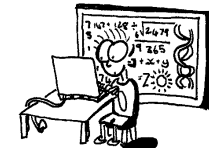
Simplifaya:

- 6.1  $-4x + 6x - x$  (1)
- 6.2  $-6x^2 - (-x^2)$  (1)
- 6.3  $-4(x + 2y)$  (2)
- 6.4  $\sqrt[3]{27x^{27}}$  (2)
- 6.5  $-3x^2y \times 4xy^3$  (2)
- 6.6  $-(2x^2)^3$  (2)
- 6.7  $\frac{4x^4}{16x^{16}}$  (2)
- 6.8  $3x - x(2x + 1)$  (2)
- 6.9  $\frac{6x^3 \times (-4x^2)}{-12x} - (2x)^4$  (4)[18]



**UMBUZO 7**

- 7.1 Ukuba  $a = -2$ , leliphi elona nani likhulu kule seti  $\{-3a; 4a; \frac{24}{a}; a^2; 1\}$ ? (2)
- 7.2 Thabatha:  $3x - 4y - z$   
 $-x - 3y + z$  (3)
- 7.3 Phindaphinda:  $-5xy^2(4x^3 - xy^3)$  (2)
- 7.4 Hlulahlula:  $\frac{9x^3y^2 - 27xy^4}{-9xy^2}$  (2)[9]







**IPHEPHA E1**

1½ iiyure  
100 amanqaku

*Imibuzo iku ph. E11*

**Khumbula:  
AKUSETYENZISWA KHALTYHULEYITHA**



	Natshurali	Intheja	Rashinali	Ir-Rashinali	Real	Imajinari
-3		✓	✓		✓	
4π				✓	✓	
√-7						✓
√36	✓	✓	✓		✓	

2.1 60 < ...  $10 = 2 \times 5$  kunye  $12 = 2^2 \times 3$   
 $\therefore LCM = 2^2 \times 3 \times 5$   
 OKANYE 10, 20, 30, 40, 50, **60**, 70, ...  
 12, 24, 36, 48, **60**, 70, ...

2.2 [Qaphela: Ikhaltyhuleyitha ayivunyelwa!]

$\sqrt{169} = 13 \dots 13^2 = 169$

$\therefore \sqrt{163} < 13$

$\therefore 13,2$  mkhulu kuno  $\sqrt{163}$  <



2.3  $\sqrt{8} < \sqrt{9} = 3$  no  $\sqrt{80} < \sqrt{81} = 9$

$\therefore$  Amanani azi-whole aphakathi ko  $\sqrt{8}$  no  $\sqrt{80}$  ngoo: 3; 4; 5; 6; 7; 8

$\therefore$  Inani lamanani azi-whole = **6** < ...

*Qiniseka ngokuphendula umbuzo!*

2.4 Eyona prodakti incinci  
 $= (-7) \times 3 = -21$  < ... *Ukumane uzama*

*Elona lincinci iya kuba lelona nani lithe qelele ukuya ekhohlo kumgca-manani!*

2.5  $F_{18} = 1; 2; 3; 6; 9; 18$  <

2.6  $\frac{10^7}{5 \times 10^4} = \left[ \frac{10 \times 10 \times 10 \times \cancel{10} \times \cancel{10} \times \cancel{10} \times \cancel{10}}{5 \times \cancel{10} \times \cancel{10} \times \cancel{10} \times \cancel{10}} \right]$   
 $= \frac{10^3}{5}$   
 $= \frac{1000}{5}$   
 $= 200$  <



2.7  $36 - 1 = 35$  < ... *Ezinokwenzeka:*  
 36 & 1; 18 & 2; 12 & 3; 9 & 4; 6 & 6

3.1.1  $1\frac{1}{2} + 3\frac{2}{3}$   
 $= \frac{3}{2} + \frac{11}{3}$   
 $= \frac{9 + 22}{6}$   
 $= \frac{31}{6}$   
 $= 5\frac{1}{6}$  <

3.1.2  $1\frac{5}{16} \div 2\frac{11}{12}$   
 $= \frac{21}{16} \div \frac{35}{12}$   
 $= \frac{3\cancel{21}}{16_4} \times \frac{12^3}{35_5}$   
 $= \frac{3 \times 3}{4 \times 5}$   
 $= \frac{9}{20}$  <

3.2

<b>A:</b> $\frac{1}{3} + \frac{1}{6} = \frac{2}{6} + \frac{1}{6} = \frac{3}{6} = \frac{1}{2} \neq \frac{1}{9}$
<b>B:</b> $\frac{1}{6} - \frac{1}{4} = \frac{2}{12} - \frac{3}{12} = -\frac{1}{12} \neq \frac{1}{2}$
<b>C:</b> $\frac{1}{2} \times \frac{1}{6} = \frac{1}{12} = 12^{\square} \checkmark$
<b>D:</b> $\frac{1}{10} \div \frac{1}{5} = \frac{1}{10} \times \frac{5}{1} = \frac{1}{2} = 2^{\square} \checkmark$

**C** no **D** banyanisile <

4.1 Inani leekati =  $\frac{3}{2+3+30}$  ka 385  
 $= \frac{3}{1 \cdot 35} \times \frac{385^{11}}{1}$   
 $= \frac{3 \times 11}{1 \times 1}$   
 $= 33$  <



4.2 *Intluva:*  
*Zoba idayagramu!*

44 iitapile ezikeriweyo

Imizuzu	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>
<b>Matthew</b>	3	3	3	3	3	3	3	3	3	3	3
<b>Charles</b>				<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>		5	5	5
<b>iTotali ekeriwe</b>	3	6	9	12	20	28	36	44			

Inani leetapile ezikerwe nguCharles =  $4 \times 5 = 20$  <

*Qaphela:* Itotali yeetapile eziyi 44 zikeriwe ngomzuzu we 8<sup>th</sup>.

OKANYE Inani leetapile ezikeriweyo  
 ► kwimizuzu yokuqala eyi 4:  $4 \times 3 = 12$  ... *Matthew*  
 ► & emva koko:  
 $3 + 5 = 8$  ngomzuzu ... *UMatthew & uCharles* ngeseleyo  
 $44 - 12 = 32$  yeetapile  
 $\therefore$  4 yemizuzu ...  $\frac{32 \text{ yeetapile}}{8 \text{ ngomzuzu}}$   
 $\therefore$  Inani leetapile ezikerwe nguCharles =  $4 \times 5 = 20$  <

4.3  $\frac{x}{y} \times \frac{y}{z} = \frac{2}{3} \times \frac{7}{5} \dots$  *Qaphela okunokwenzeka 'ukususa' u y ngokumhlaba.*  
 $\therefore \frac{x}{z} = \frac{14}{15}$   
 $\therefore \frac{z}{x} = \frac{15}{14}$  < *Ukuba amaqhezu ayalingana ii-invesi zawo ziyalingana.*