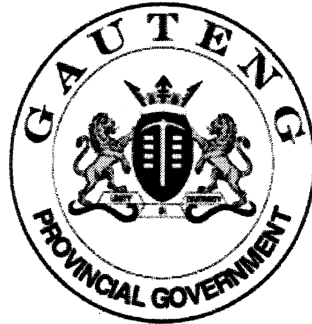


**SENIOR CERTIFICATE  
EXAMINATION  
SENIORSERTIFIKAAT-EKSAMEN**



**OCTOBER / NOVEMBER  
OKTOBER / NOVEMBER**

**2004**

**FUNCTIONAL MATHEMATICS**

***FUNKSIONELE  
WISKUNDE***

**(Second Paper)  
(Tweede Vraestel)**

**SG**

**303-2/2**

**18 pages  
18 bladsye**

FUNCTIONAL MATHEMATICS SG: Paper 2  
Geometry



303 2 2

SG

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**GAUTENGSE DEPARTEMENT VAN ONDERWYS****SENIORSERTIFIKAAT-EKSAMEN****FUNKSIONELE WISKUNDE SG**  
(Tweede Vraestel: Meetkunde)**TYD: 3 uur****PUNTE: 150**

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**INSTRUKSIES:**

- Afdelings A en B is VERPLIGTEND.
  - Beantwoord enige TWEE van die volgende Afdelings: C, D, E of F.
  - Nie-programmeerbare sakrekenaars mag gebruik word. As die vraag dit nie spesifiseer nie, dan moet die finale antwoord afgerond word tot TWEE desimale syfers.
  - Alle toepaslike berekeninge moet getoon word.
  - Geen antwoorde mag deur konstruksie en meting bepaal word nie.
  - 'n Inligtingsblad **en** grafiekpapier word voorsien.
- 
-

**GAUTENG DEPARTMENT OF EDUCATION**

**SENIOR CERTIFICATE EXAMINATION**

**FUNCTIONAL MATHEMATICS SG  
(Second Paper: Geometry)**

**TIME: 3 hours**

**MARKS: 150**

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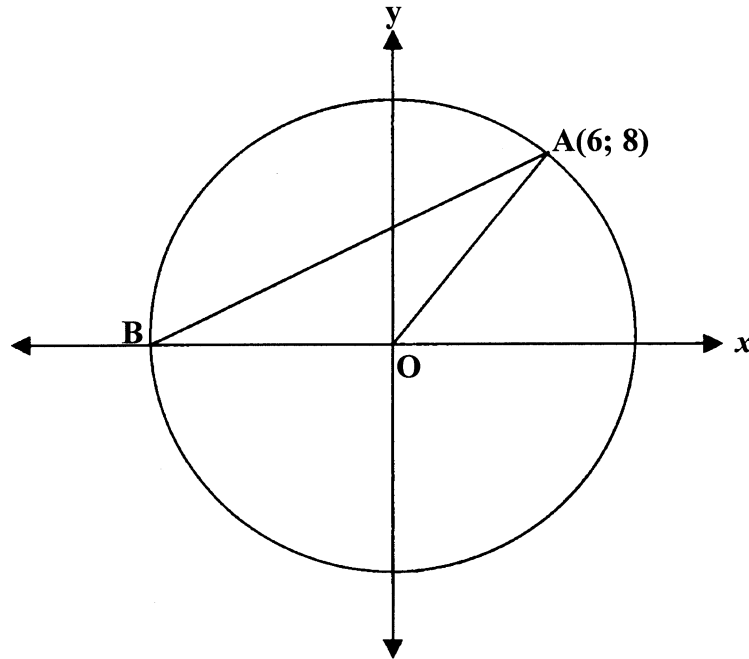
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**INSTRUCTIONS:**

- Sections A and B are **COMPULSORY**.
  - Answer any **TWO** of the following Sections: C, D, E or F.
  - Non-programmable calculators may be used. If the question does not specify, then the final answer must be rounded off to **TWO** decimal digits.
  - All appropriate calculations must be shown.
  - No answers may be determined by construction and measurement.
  - An information sheet **and** graph paper have been provided.
- 
-

**AFDELING A**  
**KOÖRDINAATMEETKUNDE**  
**VERPLIGTEND**

**VRAAG 1**



Punt **A** (6; 8) is 'n punt op die omtrek van die sirkel en **O** is die middelpunt. **A** is verbind met **B** en **O**.

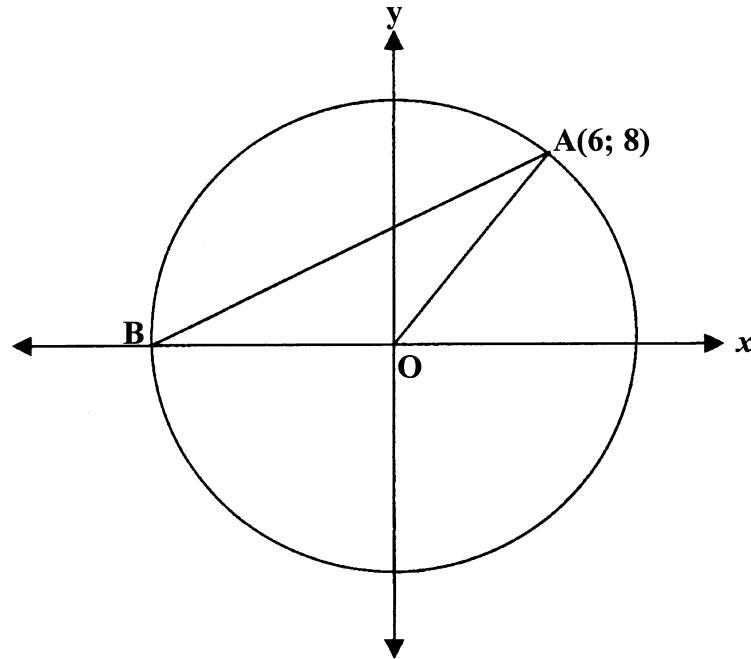
- 1.1 Bepaal die vergelyking van die sirkel. (3)
- 1.2 Skryf die radius van die sirkel neer. (1)
- 1.3 As die koördinate van **B** (-10; 0) is, bepaal die lengte van **AB**. Laat jou antwoord in eenvoudigste wortelvorm. (5)
- 1.4 Bereken die koördinate van **M**, die middelpunt van **AB**. (4)
- 1.5 Bereken die gradiënt van **AB**. (3)
- 1.6 **Q** (-6; 2) is 'n punt aan die binnekant van sirkel **O**. Bepaal of punte **A**, **Q** en **B** kolinieër is (punte is op dieselfde reguit lyn). (5)

[21]

b.o.

**SECTION A**  
**CO-ORDINATE GEOMETRY**  
**COMPULSORY**

**QUESTION 1**



Point **A** (6; 8) lies on the circumference of the circle with origin **O**, the centre. **A** is joined to **B** and **O**.

- 1.1 Determine the equation of the circle. (3)
- 1.2 Write down the radius of the circle. (1)
- 1.3 If the co-ordinates of **B** are (-10; 0), determine the length of **AB**. Leave your answer in simplest surd form. (5)
- 1.4 Calculate the co-ordinates of **M**, the midpoint of **AB**. (4)
- 1.5 Calculate the gradient of **AB**. (3)
- 1.6 **Q** (-6; 2) is a point on the inside of circle **O**. Determine whether points **A**, **Q** and **B** are co-linear (points on the same straight line). (5)

[21]

### VRAAG 2

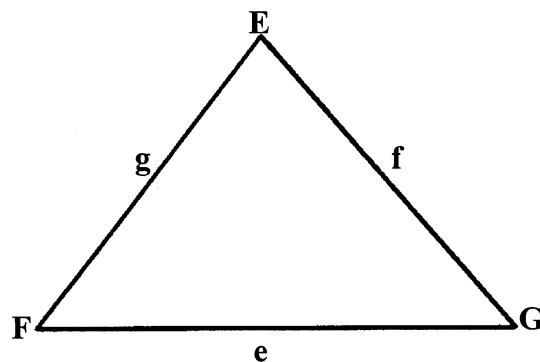
- 2.1 2.1.1 Bepaal die vergelyking van die reguit lyn in die vorm  $y = mx + c$  wat deur die punte P (3; 4) en Q (-3; 1) gaan. (6)
- 2.1.2 Bepaal die vergelyking van die reguit lyn ewewydig aan PQ en wat deur die punt R (1; -3) gaan. (4)
- 2.2 Bereken die sny punte van die reguit lyn  $y = 2x + 5$  en die sirkel  $x^2 + y^2 = 50$ . (7)  
[17]

**TOTAAL VIR AFDELING A: [38]**

### AFDELING B TRIGONOMETRIE VERPLIGTEND

#### VRAAG 3

3.1



Voltooi die volgende deur  $\triangle EFG$  te gebruik.

3.1.1  $\frac{\dots}{\sin E} = \frac{f}{\dots} = \frac{\dots}{\sin G}$  (3)

3.1.2  $e^2 = \dots + \dots - 2fg \dots$  (3)

3.1.3 Oppervlak van  $\triangle EFG = \dots ef \sin G$  (1)

**QUESTION 2**

- 2.1 2.1.1 Determine the equation of the straight line in the form  $y = mx + c$  passing through points P (3; 4) and Q (-3; 1). (6)
- 2.1.2 Determine the equation of the straight line parallel to PQ and passing through point R (1; -3). (4)
- 2.2 Calculate the points of intersection of the straight line  $y = 2x + 5$  and the circle  $x^2 + y^2 = 50$ . (7)

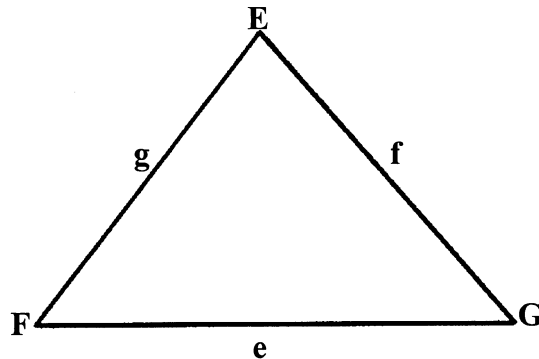
[17]

**TOTAL FOR SECTION A: [38]**

**SECTION B**  
**TRIGONOMETRY**  
**COMPULSORY**

**QUESTION 3**

3.1



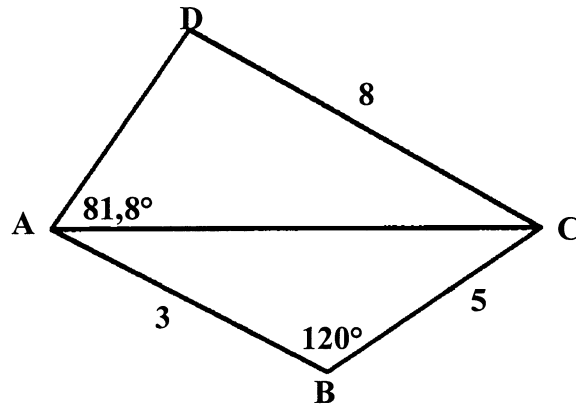
Complete the following using  $\Delta EFG$

3.1.1  $\frac{\dots}{\sin E} = \frac{f}{\dots} = \frac{\dots}{\sin G}$  (3)

3.1.2  $e^2 = \dots + \dots - 2fg \dots$  (3)

3.1.3 Area of  $\Delta EFG = \dots ef \sin G$  (1)

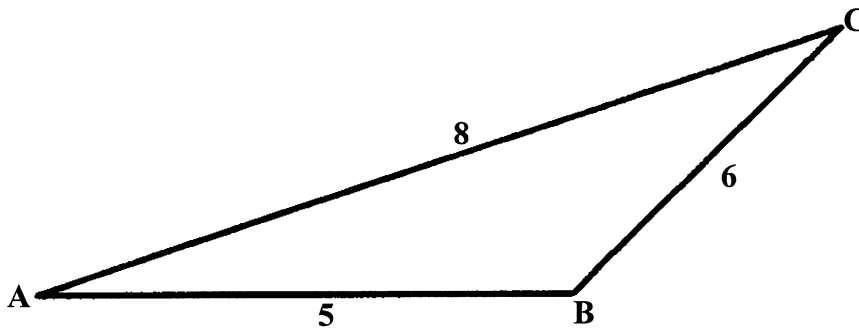
- 3.2 In die figuur hieronder is ABCD 'n vierhoek met  $AB = 3$  cm,  $BC = 5$  cm,  $DC = 8$  cm,  $\hat{B} = 120^\circ$  en  $\hat{DAC} = 81,8^\circ$ .



- 3.2.1 Toon deur berekening dat  $AC = 7$  cm. (5)
- 3.2.2 Bereken die grootte van  $\hat{D}$  as  $AC = 7$  cm. (4)
- 3.2.3 Bereken die oppervlakte van  $\triangle ABC$ , korrek tot een desimale syfer. (4)
- [20]

VRAAG 4

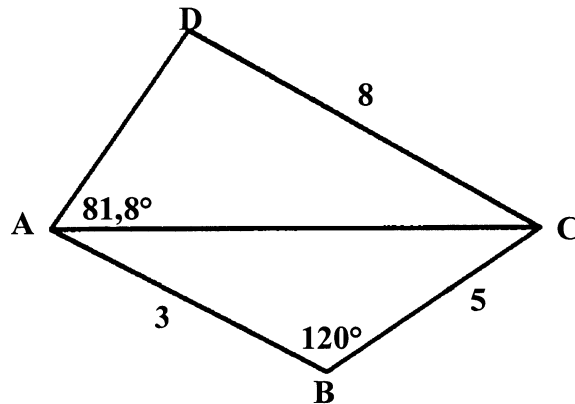
- 4.1 In  $\triangle ABC$ ,  $AB = 5$  eenhede,  $BC = 6$  eenhede en  $AC = 8$  eenhede.



- Bereken die grootte van  $\hat{A}$ , korrek tot een desimale syfer. (5)



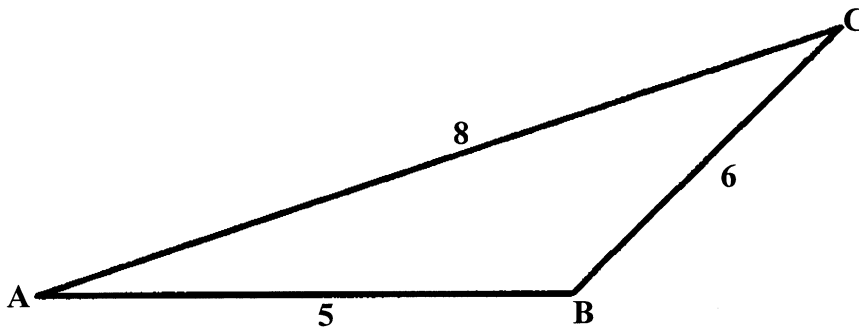
- 3.2 In the figure below, ABCD is a quadrilateral with  $AB = 3$  cm,  $BC = 5$  cm,  $DC = 8$  cm,  $\hat{B} = 120^\circ$  and  $\hat{DAC} = 81,8^\circ$ .



- 3.2.1 Show by calculation that  $AC = 7$  cm. (5)
- 3.2.2 Calculate the size of  $\hat{D}$  if  $AC = 7$  cm. (4)
- 3.2.3 Calculate the area of  $\triangle ABC$ , correct to 1 decimal digit. (4)
- [20]

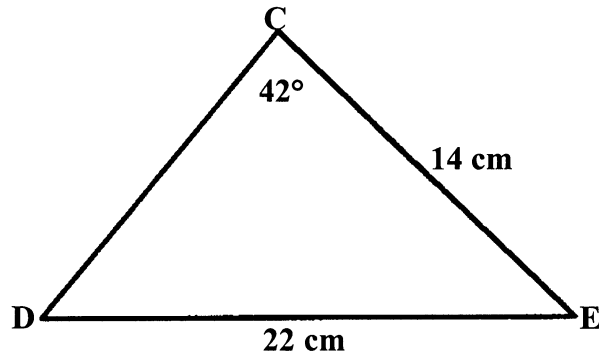
**QUESTION 4**

- 4.1 In  $\triangle ABC$ ,  $AB = 5$  units,  $BC = 6$  units and  $AC = 8$  units.



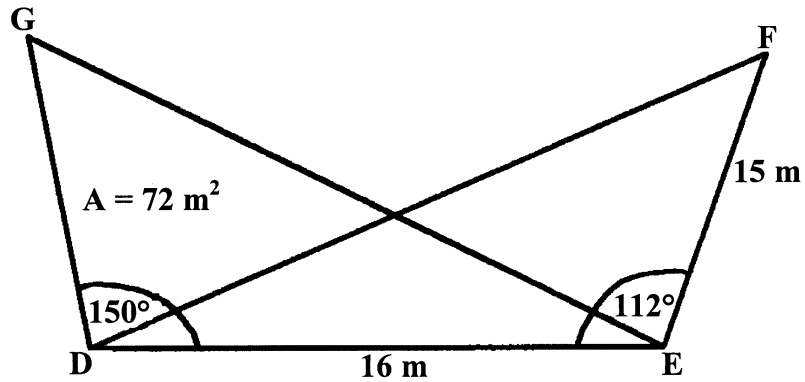
- Calculate the size of  $\hat{A}$ , correct to one decimal digit. (5)

4.2 In  $\triangle DCE$ ,  $\hat{C} = 42^\circ$ ,  $CE = 14$  cm en  $DE = 22$  cm.



Bereken die grootte van  $\hat{D}$ , korrek tot een desimale plek. (5)

4.3 In  $\triangle DEF$ ,  $\hat{D}EF = 112^\circ$ ,  $FE = 15$  m en  $DE = 16$  m.  
In  $\triangle GED$  is  $\hat{G}DE = 150^\circ$  en die oppervlakte van  $\triangle GED = 72$  m<sup>2</sup>.



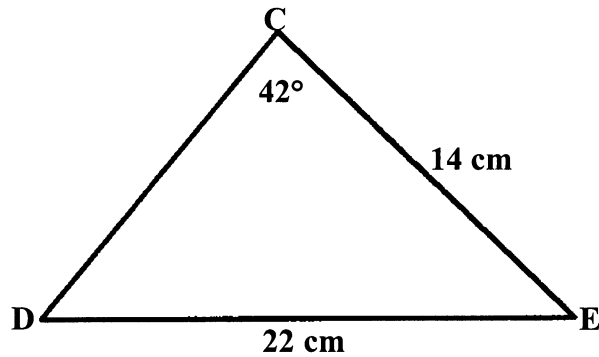
4.3.1 Bereken die oppervlakte van  $\triangle DEF$ , korrek tot een desimale syfer. (4)

4.3.2 Bereken die lengte van  $GD$ , in  $\triangle GED$ . (4)

[18]

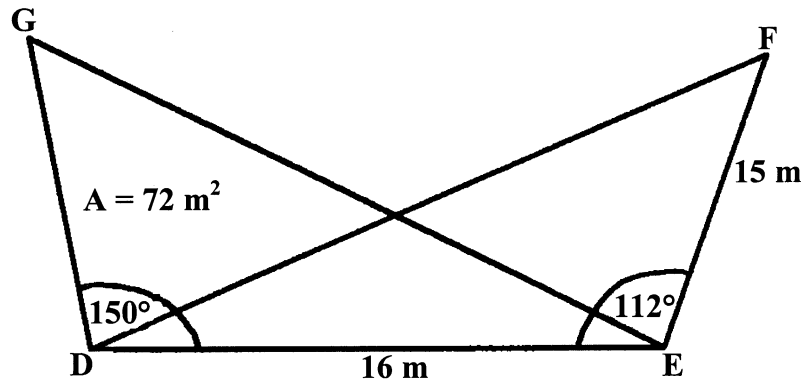
TOTAAL VIR AFDELING B: [38]

4.2 In  $\triangle DCE$ ,  $\hat{C} = 42^\circ$ ,  $CE = 14$  cm and  $DE = 22$  cm.



Calculate the size of  $\hat{D}$ , correct to one decimal place. (5)

4.3 In  $\triangle DEF$ ,  $\hat{D}EF = 112^\circ$ ,  $FE = 15$  m and  $DE = 16$  m.  
In  $\triangle GED$ ,  $\hat{G}DE = 150^\circ$  and area of  $\triangle GED = 72$  m<sup>2</sup>.



4.3.1 Calculate the area of  $\triangle DEF$ , correct to one decimal digit. (4)

4.3.2 Calculate the length of  $GD$ , in  $\triangle GED$ . (4)

[18]

**TOTAL FOR SECTION B: [38]**

**AFDELING C**  
**VERBRUIKERSWISKUNDE**  
**OPSIONEEL**

**VRAAG 5**

5.1 Mnr. X het die volgende twee opsies om R1 000 te belê:

(a) Teen 8% saamgestelde rente

**OF**

(b) Teen 8% enkelvoudige rente

5.1.1 Teken en voltooi die onderstaande tabel in jou antwoordboek.

Jare	1	2	4	6	8	10
(a) Eindbedrag teen saamgestelde rente	1 080	1 166				
(b) Eindbedrag teen enkelvoudige rente	1 080	1 160				

(4)

5.1.2 Teken die grafieke vir die tabel. Gebruik die inligting om vir mnr. X van die beste opsie te oortuig.

(4)

5.1.3 Watter opsie is die beste keuse?

(1)

5.1.4 Gebruik die grafiek om die rente te bereken na 5 jaar.

(a) op keuse (a).

(2)

(b) op keuse (b).

(2)

[13]

5.2 Me. Y belê R19 000 teen 'n saamgestelde rentekoers van 24% p.a. Rente word kwartaalliks saamgestel.

5.2.1 Toon aan dat die saamgestelde rente wat sy verdien met die volgende formule bereken kan word.

$$A = 19\,000 (1,06)^{4n}$$

(4)

5.2.2 Bereken Me. Y se rente verdien na

(a) 1 jaar

(2)

(b) 4 jaar

(2)

(c) 10 jaar

(2)

[10]

b.o.

**SECTION C**  
**CONSUMER MATHEMATICS**  
**OPTIONAL**

**QUESTION 5**

5.1 Mr X has the following two options to invest R1 000:

(a) At 8% compounded interest

**OR**

(b) At 8% simple interest

5.1.1 Copy and complete the table in your answer book.

Year	1	2	4	6	8	10
<b>(a)</b> Total investment for compounded interest	1 080	1 166				
<b>(b)</b> Total investment for simple interest	1 080	1 160				

(4)

5.1.2 Represent the table graphically. Use the information to indicate to Mr X the best option.

(4)

5.1.3 Which option is the best option?

(1)

5.1.4 Use the graph to determine the interest after 5 years.

(a) on option **(a)**.

(2)

(b) on option **(b)**.

(2)

**[13]**

5.2 Mrs Y deposits R19 000 at compound interest rate of 24% p.a. Interest is compounded quarterly.

5.2.1 Show that the compound interest she is earning can be calculated with the formula.

$$A = 19\,000 (1,06)^{4n}$$

(4)

5.2.2 Calculate Mrs Y's interest after

(a) 1 year

(2)

(b) 4 years

(2)

(c) 10 years

(2)

**[10]**

5.3 Belastingkoers vir die jaarlikse aanslag

<b>GETROUDE PERSONE</b>			
<b>Belasbare inkomste</b>		<b>Belastingkoers</b>	
R	0 - 5 000	17% van elke R1	
R	5 000 - 10 000	R 850 + 18%	van die bedrag bo R 5 000
R	10 000 - 15 000	R 1 750 + 19%	van die bedrag bo R 10 000
R	15 000 - 25 000	R 2 700 + 20%	van die bedrag bo R 15 000
R	25 000 - 30 000	R 3 700 + 21%	van die bedrag bo R 25 000
R	30 000 - 40 000	R 5 800 + 28%	van die bedrag bo R 30 000
R	40 000 - 50 000	R 8 600 + 36%	van die bedrag bo R 40 000
R	50 000 - 60 000	R 12 200 + 41%	van die bedrag bo R 50 000
R	60 000 - 80 000	R 16 300 + 42%	van die bedrag bo R 60 000
R	80 000 +	R 24 700 + 43%	van die bedrag bo R 80 000

Mnr. Z verdien R51 840 in 2002. In Januarie 2003 kry hy 'n verhoging van 18,5%.  
 Bereken sy jaarlikse inkomstebelasting vir

5.3.1 2002 (4)

5.3.2 2003 (5)  
 [9]

5.4 'n Eienaar se vaste eiendom word soos volg gewaardeer:

- Grond R18 500
- Geboue R95 300

Bepaal sy maandelikse erfbelasting betaalbaar as 3,5c per R1 op grond en 2,75c per R1 op geboue gehef word. [5]

**TOTAAL VIR AFDELING C: [37]**

5.3 Tax rates for the year of assessment

<b>MARRIED PERSONS</b>	
<b>Taxable income</b>	<b>Rates of tax</b>
R 0 - 5 000	17% of each R1
R 5 000 - 10 000	R 850 + 18% of the amount over R 5 000
R 10 000 - 15 000	R 1 750 + 19% of the amount over R 10 000
R 15 000 - 25 000	R 2 700 + 20% of the amount over R 15 000
R 25 000 - 30 000	R 3 700 + 21% of the amount over R 25 000
R 30 000 - 40 000	R 5 800 + 28% of the amount over R 30 000
R 40 000 - 50 000	R 8 600 + 36% of the amount over R 40 000
R 50 000 - 60 000	R 12 200 + 41% of the amount over R 50 000
R 60 000 - 80 000	R 16 300 + 42% of the amount over R 60 000
R 80 000 +	R 24 700 + 43% of the amount over R 80 000

Mr Z earned R51 840 for 2002. In January 2003 he received an increase of 18,5%. Calculate his annual income tax for

5.3.1 2002 (4)

5.3.2 2003 (5)  
[9]

5.4 An owner's fixed property was valued as follows:

- Land R18 500
- Buildings R95 300

Determine the monthly rates payable if 3,5c per R1 on land and 2,75c per R1 on buildings are levied. [5]

**TOTAL FOR SECTION C: [37]**

**AFDELING D**  
**BOOGMAAT**  
**OPSIONEEL**

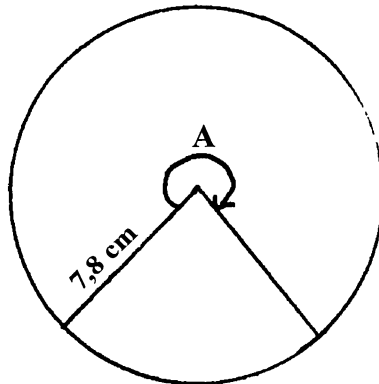
**VRAAG 6**

- 6.1 Teken en voltooi die onderstaande tabel in jou antwoordboek. (Sakrekenaar mag **nie** gebruik word nie.)

Grade	30°	60°		180°	225°	
Radiale	$\frac{\pi}{6}$		$\frac{\pi}{2}$			(5)

- 6.2 Herlei 67,2° na radiale. (2)
- 6.3 Herlei 6,283 radiale na grade. (2)
- [9]

**VRAAG 7**



Die bostaande figuur toon sektor A van 'n sirkel met 'n radius van 7,8 cm en 'n sirkelboog van 38,6 cm.

- 7.1 Gebruik formule  $S = r \theta$  en bereken die grootte van die hoek in grade. (4)
- 7.2 Gebruik formule **oppervlakte** =  $\frac{1}{2} r s$  en bereken oppervlakte van sektor. (3)
- 7.3 Gebruik formule **oppervlakte** =  $\frac{1}{2} r^2 \theta$  en bereken die hoek in grade as Oppervlakte = 30 cm<sup>2</sup> en die radius = 14 cm. (6)

[13]



**SECTION D**  
**CIRCLE MEASUREMENT**  
**OPTIONAL**

**QUESTION 6**

6.1 Complete the following table in your answer book. (Calculators may **not** be used.)

Degrees	30°	60°		180°	225°
Radians	$\frac{\pi}{6}$		$\frac{\pi}{2}$		

(5)

6.2 Reduce 67,2° to radians.

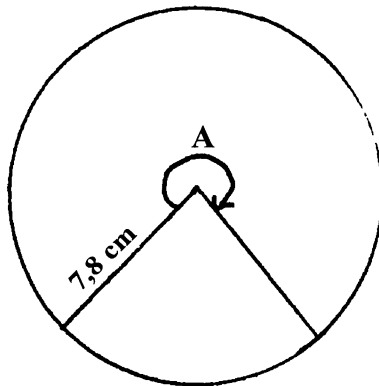
(2)

6.3 Reduce 6,283 radians to degrees.

(2)

[9]

**QUESTION 7**



The above figure indicates sector A of a circle with radius 7,8 cm and arc 38,6 cm.

7.1 Use formula  $S = r \theta$  and calculate the angle in degrees.

(4)

7.2 Use formula  $\text{area} = \frac{1}{2} r s$  and calculate area of sector.

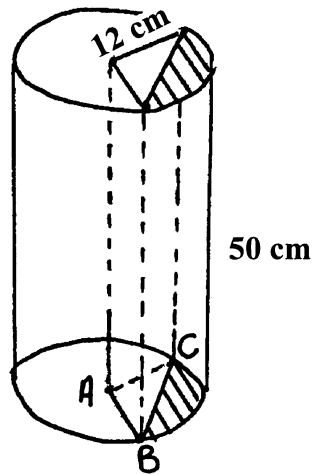
(3)

7.3 Use formula  $\text{area} = \frac{1}{2} r^2 \theta$  and calculate the angle in degrees if Area = 30 cm<sup>2</sup> and the radius is 14 cm.

(6)

[13]

VRAAG 8



Die figuur hierbo stel 'n soliede silinder voor met 'n radius van 12 cm en 'n hoogte van 50 cm. As  $\hat{BAC} = 70^\circ$ ,

- 8.1 bereken die grootte van  $\hat{BAC}$  in radiale. (2)
  - 8.2 bereken die oppervlakte van die segment en gebruik die formule **oppervlakte** =  $\frac{1}{2} r^2 (\theta - \sin\theta)$ . (4)
  - 8.3 bereken die volume van die figuur. (3)
- [9]

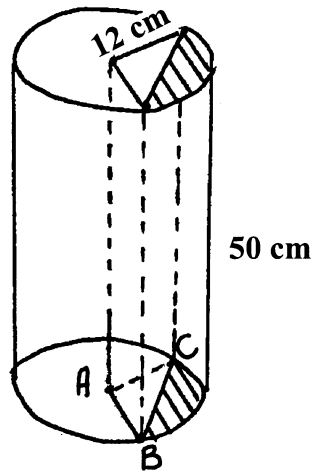
VRAAG 9

P is 'n punt op die rand van 'n metaalskyf met middelpunt O en 'n radius van 6 cm.

- 9.1 Gebruik formule  $\omega = 2\pi f$  en bereken die hoeksnelheid wat die skyf in drie omwentelinge maak. (3)
  - 9.2 Gebruik formule  $V = r\omega$  en bereken die spoed waarteen P beweeg. (3)
- [6]

TOTAAL VIR AFDELING D: [37]

QUESTION 8



The above figure indicates a solid cylinder with radius 12 cm and height 50 cm.  
If  $\hat{BAC} = 70^\circ$ , calculate

- 8.1 the size of  $\hat{BAC}$  in radians. (2)
- 8.2 the area of segment. Use formula  $\text{Area} = \frac{1}{2} r^2 (\theta - \sin\theta)$ . (4)
- 8.3 the volume of the figure. (3)
- [9]

QUESTION 9

P is a point on the edge of a metal disc with midpoint O and radius 6 cm.

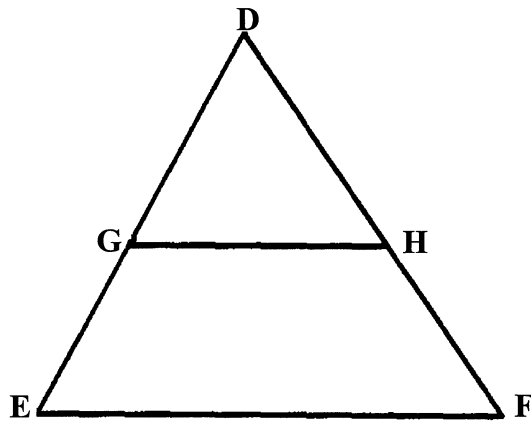
- 9.1 Use formula  $\omega = 2\pi f$  and calculate the angular velocity of the disc in three revolutions. (3)
- 9.2 Use formula  $V = r\omega$  and calculate the speed at which P moves. (3)
- [6]

TOTAL FOR SECTION D: [37]

**AFDELING E**  
**VERHOUDING, EWEREDIGHEID EN GELYKVORMIGHEID**  
**OPSIONEEL**

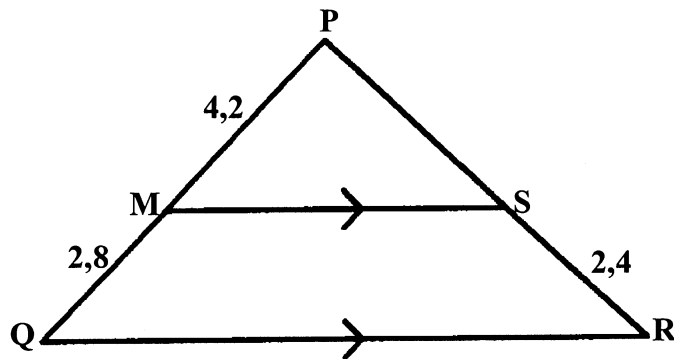
**VRAAG 10**

10.1



Voltooi: in  $\triangle DEF$ ,  $\frac{DG}{GE} = \frac{DH}{HF}$ , dan ..... // EF (1)

10.2 In  $\triangle PQS$ :  $MS \parallel QS$ ,  $MQ = 2,8$ ,  $PM = 4,2$  en  $SR = 2,4$



Bereken die lengte van

10.2.1 PS (3)

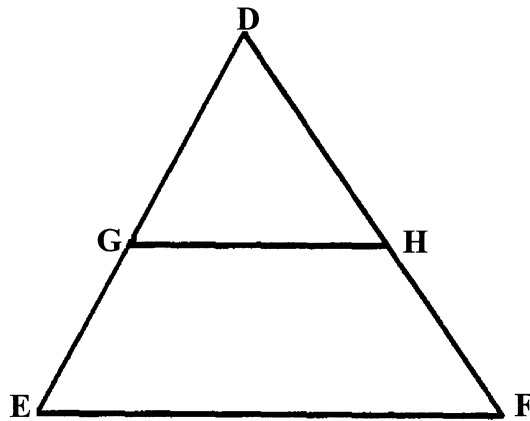
10.2.2 PQ (1)

b.o.

**SECTION E**  
**RATIO, PROPORTION AND SIMILARITY**  
**OPTIONAL**

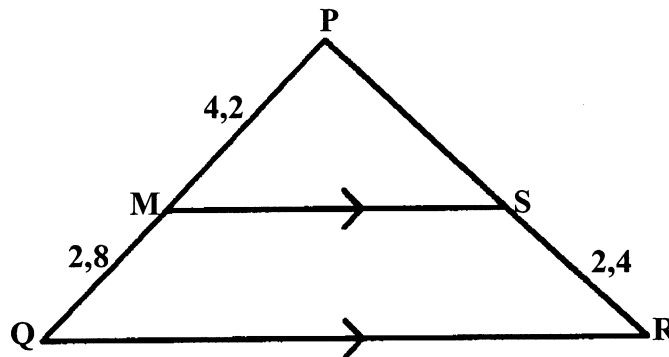
**QUESTION 10**

10.1



Complete: in  $\triangle DEF$ ,  $\frac{DG}{GE} = \frac{DH}{HF}$ , then ..... // EF (1)

10.2 In  $\triangle PQS$ :  $MS \parallel QS$ ,  $MQ = 2,8$ ,  $PM = 4,2$  and  $SR = 2,4$

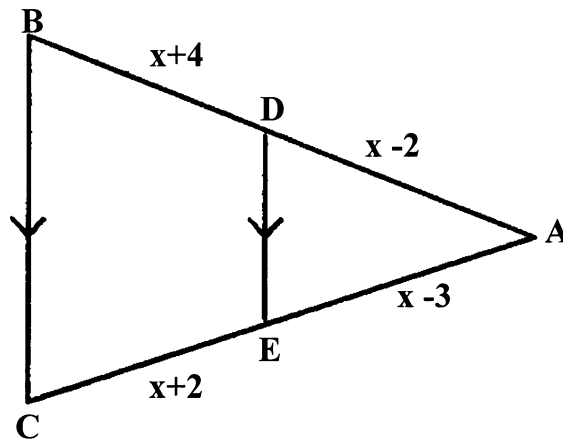


Calculate the length of

10.2.1 PS (3)

10.2.2 PQ (1)

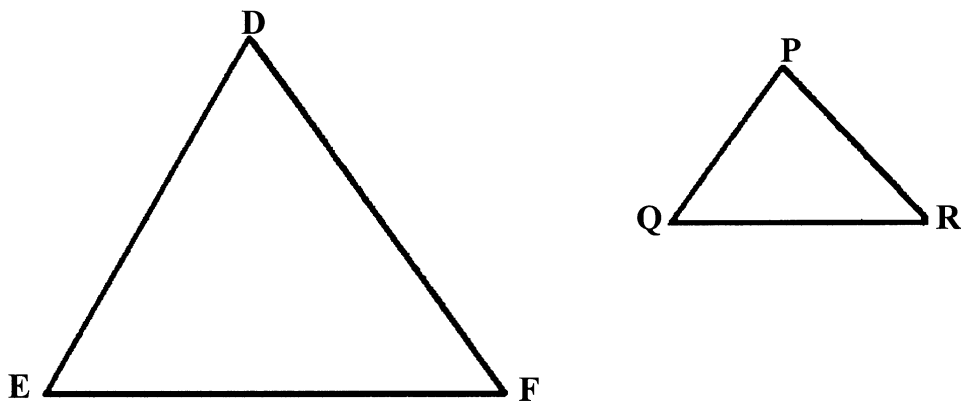
- 10.3 In  $\triangle ABC$ ,  $DE \parallel BC$ ,  $AD = x - 2$ ,  $DB = x + 4$ ,  $AE = x - 3$  en  $EC = x + 2$   
Bereken die waarde van  $x$ . (6)



[11]

VRAAG 11

11.1



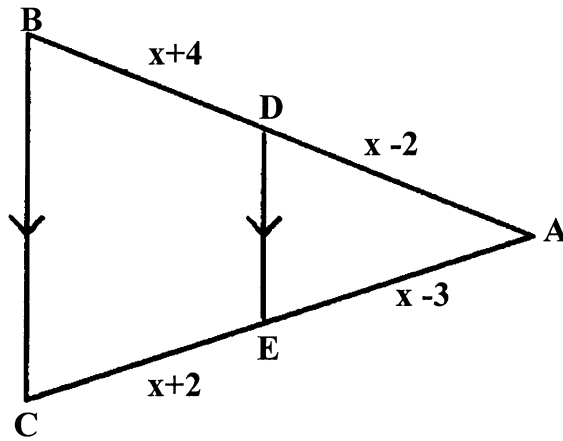
As  $\triangle DEF \parallel \triangle PQR$  dan

11.1.1  $\hat{D} = \dots$  (1)

11.1.2  $\hat{E} = \dots$  (1)

11.1.3  $\frac{DE}{\dots} = \frac{\dots}{PR} = \frac{EF}{\dots}$  (3)

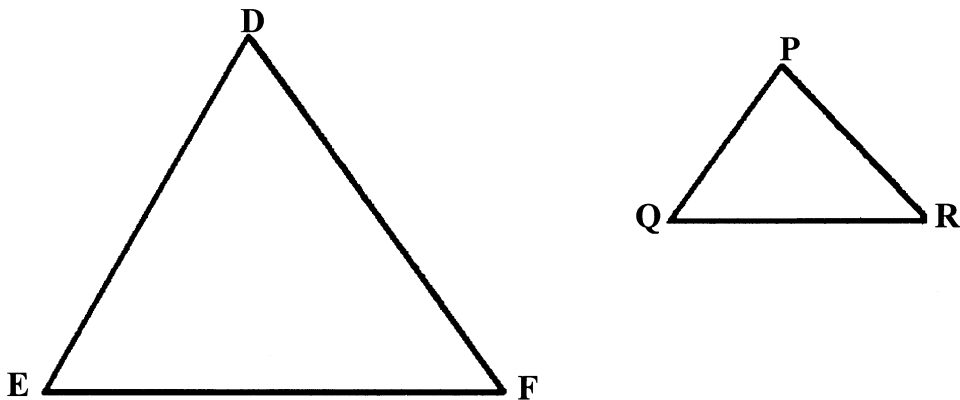
- 10.3 In  $\triangle ABC$ ,  $DE \parallel BC$ ,  $AD = x - 2$ ,  $DB = x + 4$ ,  $AE = x - 3$  and  $EC = x + 2$   
Calculate the value of  $x$ . (6)



[11]

QUESTION 11

11.1



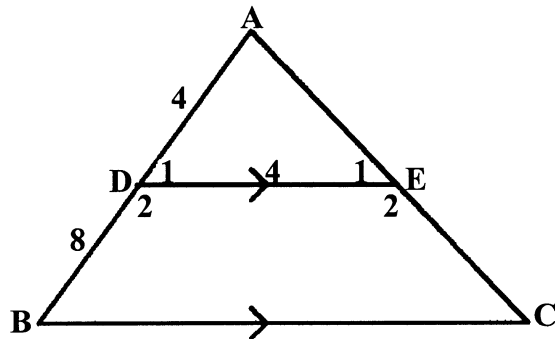
If  $\triangle DEF \parallel \triangle PQR$ , then

11.1.1  $\hat{D} = \dots$  (1)

11.1.2  $\hat{E} = \dots$  (1)

11.1.3  $\frac{DE}{\dots} = \frac{\dots}{PR} = \frac{EF}{\dots}$  (3)

11.2 In  $\triangle ABC$ ,  $DE \parallel BC$ ,  $AD = 4$ ,  $BD = 8$  en  $DE = 4$ .

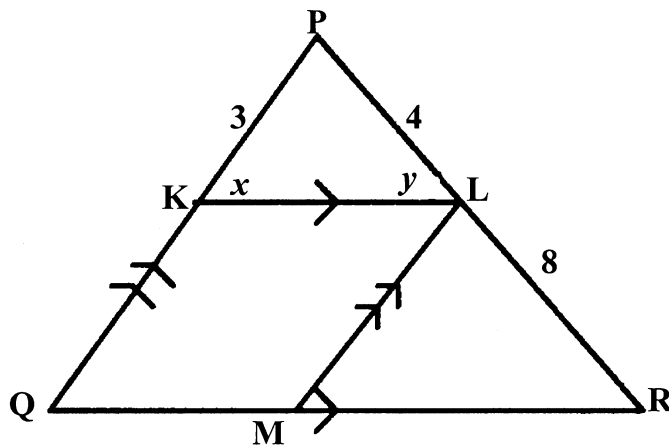


11.2.1 Gee DRIE redes waarom  $\triangle ABC \sim \triangle ADE$ . (3)

11.2.2 Bereken die lengte van BC. (5)  
[13]

VRAAG 12

12.1 In die figuur:  $KL \parallel QR$ ,  $LM \parallel PQ$ .  $PK = 3$  eenhede,  $PL = 4$  eenhede,  $\hat{P}KL = x$  en  $\hat{P}LK = y$



12.1.1 Bereken die lengte van KQ. (3)

12.1.2 Bereken  $\hat{P}QR$  in terme van  $x$ . (1)

12.1.3 Bereken  $\hat{P}RQ$  in terme van  $y$ . (1)

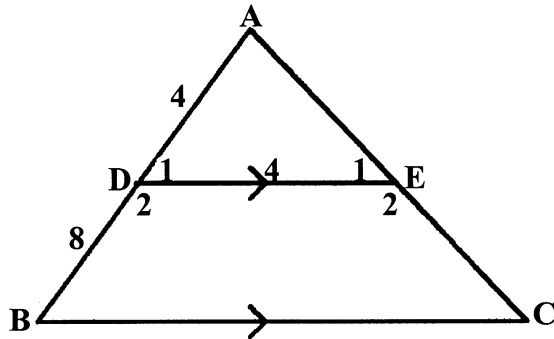
12.1.4 Bereken  $\hat{LMR}$  in terme van  $x$ . (1)

12.1.5 Voltooi:  $\triangle PKL \dots \triangle LMR$  (1)

b.o.



11.2 In  $\triangle ABC$ ,  $DE \parallel BC$ ,  $AD = 4$ ,  $BD = 8$  and  $DE = 4$ .



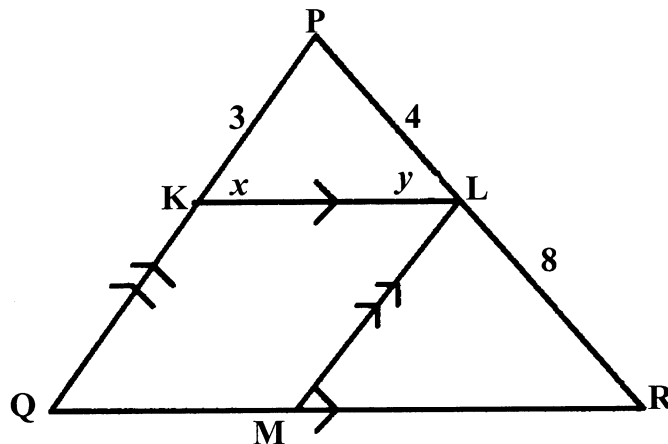
11.2.1 Give THREE reasons why  $\triangle ABC \sim \triangle ADE$ . (3)

11.2.2 Calculate the length of BC. (5)

[13]

QUESTION 12

12.1 In the figure:  $KL \parallel QR$ ,  $LM \parallel PQ$ .  $PK = 3$  units,  $PL = 4$  units,  $\hat{P}KL = x$  and  $\hat{P}LK = y$



12.1.1 Calculate the length of KQ. (3)

12.1.2 Determine  $\hat{P}QR$  in terms of  $x$ . (1)

12.1.3 Determine  $\hat{P}RQ$  in terms of  $y$ . (1)

12.1.4 Determine  $\hat{L}MR$  in terms of  $x$ . (1)

12.1.5 Complete:  $\triangle PKL \dots \triangle LMR$  (1)

P.T.O.

12.1.6 Voltooi vervolgens:  $\frac{PK}{\dots} = \frac{KL}{\dots} = \frac{\dots}{LR}$  (3)

12.1.7 Bereken die lengte van LM. (3)  
**[13]**

**TOTAAL VIR AFDELING E: [37]**

**AFDELING F**  
**STATISTIEK**  
**OPSIONEEL**

**VRAAG 13**

In 'n opname wat gemaak is oor die Wiskunde toetspunte van 'n groep van 35 leerders is die volgende gevind:

Toetspunte in %								
28	11	44	35	40	50	51	34	17
25	19	15	40	43	48	86	52	25
80	32	30	25	27	40	35	65	55
28	13	36	42	63	53	67	32	

13.1 Stel die inligting hierbo voor met behulp van 'n stingel-en-blaardiagram. (4)

13.2

Klasinterval	Telling	Frekwensie	Kumulatiewe frekwensie
10 – 20			
21 – 31			
32 – 42			
43 – 53			
54 – 64			
65 – 75			
76 – 86			

13.2.1 Teken en voltooi die tabel in jou antwoordboek. (8)

13.2.2 Teken 'n histogram van die frekwensie. (4)

13.2.3 Teken die kumulatiewe frekwensiekurwe op die grafiekpapier. (4)

13.2.4 Gebruik jou grafiek om die eerste kwartiel en die derde kwartiel te bepaal. (2)

12.1.6 Hence complete:  $\frac{PK}{\dots} = \frac{KL}{\dots} = \frac{\dots}{LR}$  (3)

12.1.7 Calculate the length of LM. (3)  
 [13]

**TOTAL FOR SECTION E: [37]**

**SECTION F**  
**STATISTICS**  
**OPTIONAL**

**QUESTION 13**

In a survey on the Mathematics test results of a group of 35 learners the following is found:

Test marks in %								
28	11	44	35	40	50	51	34	17
25	19	15	40	43	48	86	52	25
80	32	30	25	27	40	35	65	55
28	13	36	42	63	53	67	32	

13.1 Present the above information on a stem-and-leaf diagram. (4)

13.2

Class interval	Score	Frequency	Cumulative frequency
10 – 20			
21 – 31			
32 – 42			
43 – 53			
54 – 64			
65 – 75			
76 – 86			

13.2.1 Redraw the table in your answer book and complete it. (8)

13.2.2 Draw a histogram of the frequency. (4)

13.2.3 Draw the cumulative frequency curve on the graph paper. (4)

13.2.4 Use your graph to determine the first quartile and third quartile. (2)

- 13.3 Herrangskik die toetspunte in stygende orde. (2)
- 13.4 Skryf die modus neer van die toetspunte. (2)
- 13.5 Bepaal die mediaan van die toetspunte. (1)
- 13.6 Bereken die rekenkundige gemiddelde van die toetspunte, afgerond tot die naaste heelgetal. (3)
- 13.7 Bereken die gebied (omvang) van die toetspunte. (2)
- 13.8 Bereken die standaardafwyking van die toetspunte. Rond jou antwoord af tot twee desimale syfers. (5)

**TOTAAL VIR AFDELING F: [37]**

**TOTAAL: 150**

- 13.3 Rearrange the marks in ascending order. (2)
- 13.4 Write down the mode of the marks. (2)
- 13.5 Determine the median of the marks. (1)
- 13.6 Calculate the arithmetic mean of the marks, rounded off to the nearest integer. (3)
- 13.7 Calculate the range of the marks. (2)
- 13.8 Calculate the standard deviation of the marks. Round off your answer correct to two decimal digits. (5)

**TOTAL FOR SECTION F: [37]**

**TOTAL: 150**



**INFORMATION SHEET / INLIGTINGSBLAD**

**1. CO-ORDINATE GEOMETRY /  
 KOÖRDINAATMEETKUNDE**

$$M_{(x;y)} = \left( \frac{x_A + x_B}{2}, \frac{y_A + y_B}{2} \right)$$

$$d_{AB} = \sqrt{(x_B - x_A)^2 + (y_B - y_A)^2}$$

$$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y = mx + c$$

$$y - y_1 = m(x - x_1)$$

$$\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\frac{x}{a} + \frac{y}{b} = 1$$

$$x^2 + y^2 = r^2$$

**4. CONSUMER MATHEMATICS /  
 VERBRUIKERSWISKUNDE**

$$I = \frac{krt}{100}$$

$$A = P \left( 1 + \frac{r}{100} \right)^n$$

**5. STATISTICS / STATISTIEK**

$$S = \sqrt{\frac{\sum x^2 - n\bar{x}^2}{n-1}}$$

$$\hat{C} = \sqrt{\frac{\sum x^2 - N\mu^2}{N}}$$

**2. TRIGONOMETRY /  
 TRIGONOMETRIE**

For any  $\Delta ABC$ : / Vir enige  $\Delta ABC$ :

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$a^2 = b^2 + c^2 - 2bc \cdot \cos A$$

$$\text{Area / Oppervlakte } \Delta ABC = \frac{1}{2} a \cdot b \cdot \sin C$$

**3. CIRCULAR MEASUREMENT /  
 BOOGMAAT**

$$S = r\theta$$

$$A = \frac{1}{2} r^2 \theta$$

$$A = \frac{1}{2} rs$$

$$V = r\omega$$

$$\omega = 2\pi f$$

$$A = \frac{1}{2} r^2 (\theta - \sin \theta)$$





CANDIDATE'S NUMBER / *KANDIDAAT SE NOMMER*

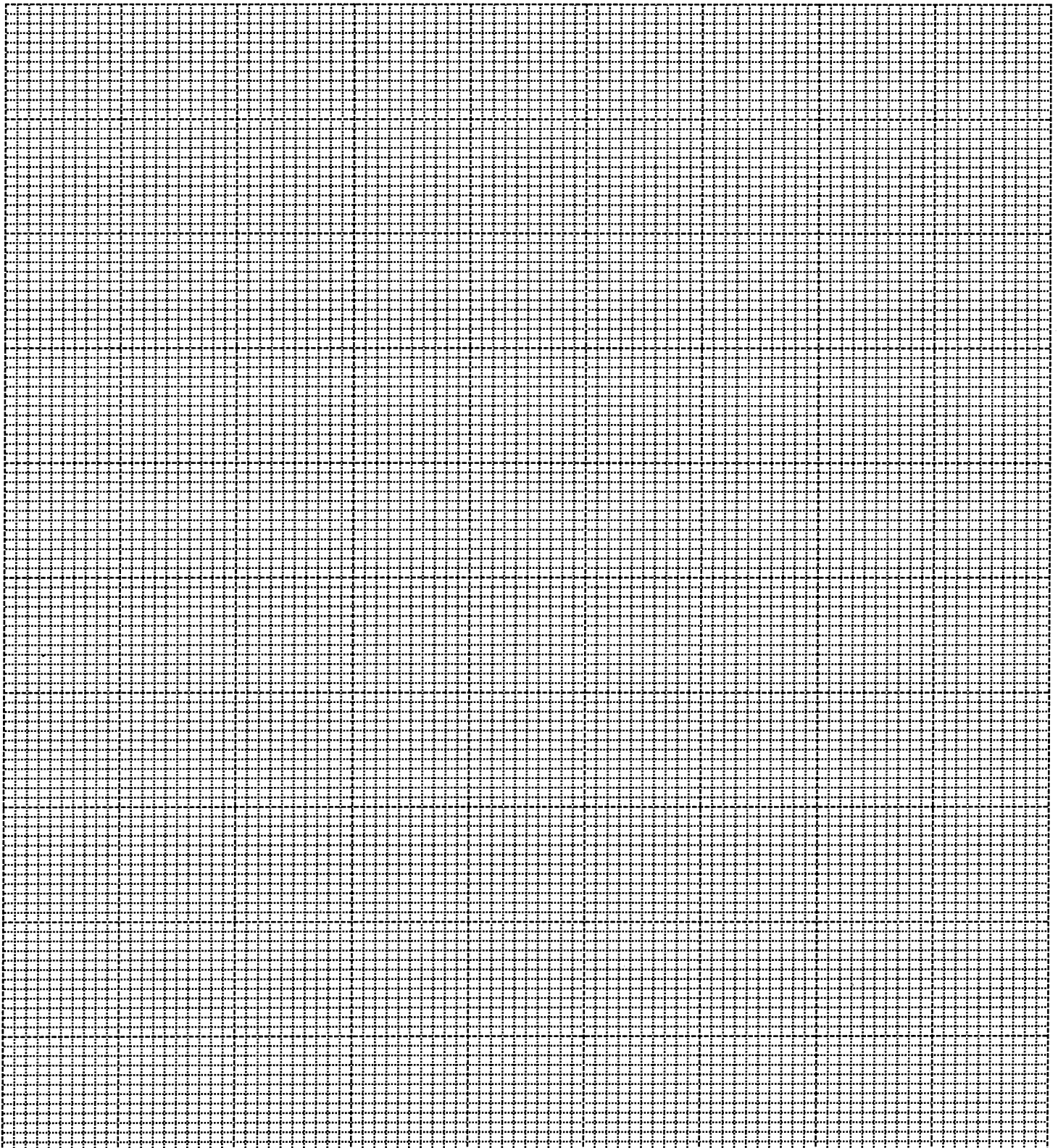
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INSTRUCTION / *INSTRUKSIE*:

- Use this graph paper for Question 5 and place it at the back of your answer book.
- *Gebruik hierdie grafiekpapier vir Vraag 5 en plaas dit agter in jou antwoordboek.*





CANDIDATE'S NUMBER / KANDIDAAT SE NOMMER

8	0	3
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INSTRUCTION / INSTRUKSIE:

- Use this graph paper for Question 13 and place it at the back of your answer book.
- *Gebruik hierdie grafiekpapier vir Vraag 13 en plaas dit agter in jou antwoordboek.*

