



MATHEMATICS

REVISION BOOKLET MEMORANDUM 2025 TERM 3

Grade 11

This revision program is designed to assist you in revising the critical content and skills envisaged/ planned to be covered during the 3rd term. The purpose is to prepare you to understand the key concepts and to provide you with an opportunity to establish the required standard and the application of the knowledge necessary to succeed in the Grade 11 examination.

The revision program covers the following topics:

- Trigonometric Formulae
- Statistics

If you wish to master Mathematics you need to remember:

- ✓ The final answer is by no means the most important in Mathematics. Systematic, detailed and logical layout of every step of your working is the most important.
- ✓ Do not accept the fact that you are careless. Carelessness can be overcome by checking your work. It is important to check the correctness and the validity of every step of your calculations. In this way carelessness is overcome.
- ✓ Never take short cuts in Mathematics by leaving out steps in your working.
- ✓ Despair in Mathematics can destroy your Mathematics. Never give up: try again and again and ... until you get it right. Continually say to yourself: I CAN!!!!
The more you practice the better you will become!

INDEX

TOPIC	PAGE
TRIGONOMETRY FORMULAE: SECTION A	3
TRIGONOMETRY FORMULAE: SECTION B	5
STATISTICS: SECTION A	8
STATISTICS: SECTION B	12

MEMORANDUM: GR 11 TRIG FORMULAE/ FORMULES

SECTION/ AFDELING A

QUESTION/ VRAAG 1 (Nov 2018/2016)

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
1.1	$QR^2 = PR^2 + PQ^2 - 2PR \cdot PQ \cos \hat{P}$ $QR^2 = (3)^2 + (9,2)^2 - 2(3)(9,2)\cos 67^\circ$ $QR = \sqrt{(3)^2 + (9,2)^2 - 2(3)(9,2)\cos 67^\circ}$ $QR = 8,49\text{cm}$	1.2.1	In $\triangle ABD$ $\frac{BD}{\sin 109,16^\circ} = \frac{90,52}{\sin 31,23^\circ}$ $BD = \frac{90,52 \times \sin 109,16^\circ}{\sin 31,23^\circ}$ $= 164,92 \text{ m}$
1.2.2	In $\triangle BCD$: $CD^2 = 164,92^2 + 235^2 - 2 \times 164,92 \times 235 \times \cos 48,88^\circ$ $CD^2 = 31448,4874$ $CD = 177,34 \text{ m}$		

QUESTION/ VRAAG 2 (Model 2007)

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
2.1.1	$\hat{L} = 10^\circ \dots \text{alt./ verw. } \angle; BL//T_{\text{hor}}$	2.1.2	$\frac{25}{KT} = \sin 17^\circ$ $KT \cdot \sin 17^\circ = 25$ $KT = \frac{25}{\sin 17^\circ}$ $KT = 85,51\text{m}$
2.1.3	$\frac{KL}{\sin 7^\circ} = \frac{85,51}{\sin 10^\circ}$ $KL = \frac{85,51 \cdot \sin 7^\circ}{\sin 10^\circ}$ $KL = 60,01 \text{ m}$		
2.2.1	$\hat{C}_1 = 36^\circ$ $G\hat{C}A = 41^\circ$ $GA^2 = (8,3)^2 + (4,8)^2 - 2(8,3)(4,8) \cdot \cos 41^\circ$ $GA^2 = 31,79474065\dots$ $GA = 5,6 \text{ kms}$	2.2.2	$\text{Area } \triangle GCA = \frac{1}{2} \cdot (8,3)(4,8) \cdot \sin 41^\circ$ $\text{Area } \triangle GCA = 13,07 \text{ kms}^2$

QUESTION/ VRAAG 3 (Nov 2007)

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
3.1	$\widehat{CGS} = 64^\circ \dots \text{adj./ aanl. Suppl}$	3.4	$\frac{\sin \widehat{GSH}}{7,32} = \frac{\sin 116^\circ}{20,96}$ $\sin \widehat{GSH} = 0,3138918139\dots$ $\widehat{GSH} = 18,3^\circ$
3.2	$\sin 64^\circ = \frac{15}{SG}$ $SG = \frac{15}{\sin 64^\circ}$ $SG = 16,69 \text{ m}$		
3.3	$SH^2 = (16,69)^2 + (7,32)^2 - 2(16,69)(7,32).\cos 116^\circ$ $= 439,2508074\dots$ $SH = 20,96 \text{ m}$ OR/ OF $CG = \sqrt{16,69^2 - 15^2} = 7,32$ $SH = \sqrt{15^2 + 14,64^2} = 20,96$		

QUESTION/ VRAAG 4 (Nov 2013)

#	Suggested answers/ <i>Voorgestelde antwoorde</i>	#	Suggested answers/ <i>Voorgestelde antwoorde</i>
4.1	Proof/ <i>Bewys</i>	4.2.2	$\frac{\sin A}{BC} = \frac{\sin B}{AC}$ $\frac{\sin A}{160} = \frac{\sin 60^\circ}{140}$ $\sin A = \frac{160 \sin 60^\circ}{140}$ $= \frac{4\sqrt{3}}{7}$
4.2.1	$AC^2 = AB^2 + BC^2 - 2 \cdot AB \cdot BC \cdot \cos B$ $= (60)^2 + (160)^2 - 2(60)(160) \cos 60^\circ$ $= 3600 + 25600 - 9600$ $= 19600$ $AC = 140mm$		
4.2.3	Area of/ <i>Oppervlakte van</i> $\triangle ABD$ $= \frac{1}{2} \cdot AB \cdot AD \cdot \sin A$ $= \frac{1}{2} (60)(70) \left(\frac{4\sqrt{3}}{7} \right)$ $= 1200\sqrt{3} \text{ units}^2$ $= 2078,5 \text{ units}^2$		
4.3	O is the midpoint of SR/ <i>O is die middelpunt van SR</i> PQRS will be a square if/ <i>sal 'n vierkant wees as</i> : PS = SR $OS = \frac{1}{2} SR$ $\tan \alpha = \frac{PS}{OS} = \frac{2OS}{OS} = \frac{2}{1}$ $\alpha = 63,43^\circ$		

QUESTION/ VRAAG 5 (Jun 2017)

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
5.1	$EG^2 = 15^2 + 6^2 \dots$ Pyth. $= 261$ $\Rightarrow EG = \sqrt{261} \text{ cm}$	5.2	$EB^2 = 8^2 + 6^2 = 100$, $GB^2 = 15^2 + 8^2 = 289$, $EG^2 = 15^2 + 6^2 = 261$ $\cos \hat{EBG} = \frac{EB^2 + BG^2 - EG^2}{2 \cdot EB \cdot BG}$ $= \frac{100 + 289 - 261}{2 \cdot 10 \cdot 17}$ $= 0,3764705$ $\therefore \hat{EBG} = 67,9^\circ$

QUESTION/ VRAAG 6 (Nov 2018)

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
6.1	$\hat{ACD} = \theta - \alpha$	6.3	$AD = \frac{17 \sin(58^\circ - 23^\circ)}{\cos 23^\circ}$ $AD = 10,59 \text{ units}$
6.2	$\hat{D}_1 = 90^\circ + \alpha$ $\frac{\sin(90^\circ + \alpha)}{h} = \frac{\sin(\theta - \alpha)}{AD}$ $\frac{\cos \alpha}{h} = \frac{\sin(\theta - \alpha)}{AD}$ $AD = \frac{h \sin(\theta - \alpha)}{\cos \alpha}$		
6.4	Area of $\triangle ADC = \frac{1}{2} \times AD \times AC \times \sin \hat{A}$ $= \frac{1}{2} \times 10,59 \times 17 \times \sin 32^\circ$ $= 47,70 \text{ unit}^2$	OR/ OF $\text{Area of } \triangle ADC = \frac{1}{2} \times CD \times AC \times \sin 35^\circ$ $= \frac{1}{2} \times 9,78660... \times 17 \times \sin 35^\circ$ $= 47,71 \text{ unit}^2$	

SECTION/ AFDELING B**QUESTION/ VRAAG 7 (Nov 2017)**

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
7.1	$x^2 = (2x)^2 + (3)^2 - 2(2x)(3)\cos\theta$ $12x\cos\theta = 3x^2 + 9$ $\cos\theta = \frac{3x^2 + 9}{12x}$ $\cos\theta = \frac{3(x^2 + 3)}{12x}$ $\cos\theta = \frac{x^2 + 3}{4x}$	7.2.1	$\cos\theta = \frac{(2,4)^2 + 3}{4(2,4)}$ $\cos\theta = \frac{73}{80} = 0,9125$ $\theta = 24,15^\circ$

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
7.2.2	$\text{Area of/van } \triangle PQR = \frac{1}{2} \times PQ \times QR \times \sin \hat{Q}$ $= \frac{1}{2} \times 4,8 \times 3 \times \sin 24,15$ $= 2,95 \text{ units/eenh}^2$	7.3	For/vir $x > 0$, $\cos \theta > 0$ $0^\circ < \theta < 90^\circ$ $0 < \frac{x^2 + 3}{4x} < 1$ $x^2 + 3x < 4x$ $x^2 - 4x + 3 < 0$ $(x-1)(x-3) < 0$ $1 < x < 3$

QUESTION/ VRAAG 8 (Nov 2015/ 2016)

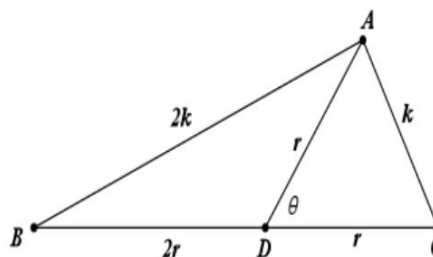
#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
8.1.1	$PQ^2 = QR^2 + PR^2 - 2QR.PR.\cos \theta$ $y^2 = (2y)^2 + (2y)^2 - 2(2y)(2y).\cos \theta$ $\cos \theta = \frac{4y^2 + 4y^2 - y^2}{2(2y)(2y)}$ $= \frac{7y^2}{8y^2}$ $= \frac{7}{8}$	8.1.2	Constr./ Konstr.: Draw/ Trek PT $PT \perp QR$ [$\angle$ in semi-circle/halfsirkel] $\sin \theta = \frac{PT}{PR} = \frac{PT}{2y}$ $\therefore PT = 2y \sin \theta$
8.2	$c^2 = a^2 + b^2 - 2ab \cos \hat{C}$ $\therefore \cos \hat{C} = \frac{a^2 + b^2 - c^2}{2ab}$ $1 + \cos \hat{C} = 1 + \frac{a^2 + b^2 - c^2}{2ab}$ $= \frac{2ab}{2ab} + \frac{a^2 + b^2 - c^2}{2ab}$ $= \frac{a^2 + 2ab + b^2 - c^2}{2ab}$ $= \frac{(a+b)^2 - c^2}{2ab}$ $= \frac{(a+b+c)(a+b-c)}{2ab}$ OR/ OF $c^2 = a^2 + b^2 - 2ab \cos C$ $2ab \cos C = a^2 + b^2 - c^2$ $2ab + 2ab \cos C = a^2 + 2ab + b^2 - c^2$ $2ab(1 + \cos C) = (a+b)^2 - c^2$ $1 + \cos C = \frac{(a+b)^2 - c^2}{2ab}$		

QUESTION/ VRAAG 9 (Jun 2015)

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
9.1	$QR^2 = PQ^2 + RP^2 - 2 \cdot PQ \cdot RP \cdot \cos \hat{P}$ $(\sqrt{3}x)^2 = x^2 + x^2 - 2 \cdot x \cdot x \cdot \cos \hat{P}$ $\cos \hat{P} = \frac{x^2 + x^2 - (\sqrt{3}x)^2}{2x \cdot x}$ $\cos \hat{P} = \frac{-x^2}{2x^2}$ $\cos \hat{P} = -\frac{1}{2}$ $\hat{P} = 120^\circ$	9.2	$\hat{P}RQ = \hat{P}QR = 30^\circ$ ($\angle$ s opp equal sides/ $\angle$ e teenoor gelyke sye) $\hat{Q}RS = 150^\circ$ ($\angle$ s on a str line/ $\angle$ e op reguithyn) Area of/Opp van $\Delta QRS = \frac{1}{2}(QR)(RS)(\sin \hat{Q}RS)$ $= \frac{1}{2}(\sqrt{3}x)(\frac{3}{2}x)(\sin 150^\circ)$ $= (\frac{3\sqrt{3}}{4}x^2)(\frac{1}{2})$ $= \frac{3\sqrt{3}}{8}x^2 = 0,65x^2$

QUESTION/ VRAAG 10 (KABV p 42)

#	Suggested answers/ Voorgestelde antwoorde	#	Suggested answers/ Voorgestelde antwoorde
	In ΔADC : $k^2 = r^2 + r^2 - 2(r)(r) \cos \theta$ $\therefore \cos \theta = \frac{r^2 + r^2 - k^2}{2r^2} = \frac{2r^2 - k^2}{2r^2} \dots (1)$ (1) in (2): $-\left(\frac{2r^2 - k^2}{2r^2}\right) = \frac{5r^2 - 4k^2}{4r^2} \Rightarrow \frac{k^2 - 2r^2}{2kr} = \frac{5r^2 - 4k^2}{4r^2}$ $\times 4r^2$: $2k^2 - 4r^2 = 5r^2 - 4k^2$ $\therefore 6k^2 = 9r^2$ $\therefore k^2 = \frac{9}{6}r^2 \dots (3)$ (3) in (1): $\cos \theta = \frac{2r^2 - (\frac{9}{6}r^2)}{2r^2} = \frac{12r^2 - 9r^2}{6} \times \frac{1}{2r^2}$ $= \frac{3r^2}{6} \times \frac{1}{2r^2}$ $= \frac{1}{4}$		In ΔABD : $(2k)^2 = (2r)^2 + r^2 - 2(2r)r \cos(180^\circ - \theta)$ $\therefore 4k^2 = 4r^2 + r^2 - 4r^2(-\cos \theta)$ $\therefore -\cos \theta = \frac{4r^2 + r^2 - 4k^2}{4r^2} = \frac{5r^2 - 4k^2}{4r^2} \dots (2)$



MEMORANDUM: GR 11 STATISTICS/ STATISTIEK

SECTION/AFDELING A

QUESTION/VRAAG 1																
1.1.1	26	answer/antwoord (1)														
1.1.2	$IQR/IKW = 33 - 19 = 14$ Answer only – full marks Slegs antwoord - volpunte	Q_1 Q_2 answer/ antwoord (3)														
1.1.3	$\bar{x} = \frac{392}{15} = 26,13$ Answer only – full marks Slegs antwoord - volpunte	$\frac{392}{15}$ answer/ antwoord (2)														
1.1.4	$\delta = 7.7$	answer/ antwoord (2)														
1.2	$(\bar{x} - \delta ; \bar{x} + \delta) (18,36 : 33,90)$ 5 people that are outside one standard deviation of the mean/ 5 mense wat buite een standaard afwyking van die gemiddelde is It will be/Dit sal $\frac{5}{15} \times 100 = 33,33\%$	interval no. of people outside one sd/ aantal mense buite een SA percentage/ persentasie (3)														
[11]																
QUESTION/ VRAAG 2																
2.1	80	answer/ antwoord (1)														
2.2	$80 - 22 = 58$	$80 - 22$ answer/ antwoord (2)														
2.3	$Q_2 = 28$	answer/ antwoord (2)														
2.4	<table><tr><th>Marks obtained <i>Punte behaal</i></th><th>Frequency <i>Frekwensie</i></th></tr><tr><td>$0 < x \leq 10$</td><td>5</td></tr><tr><td>$10 < x \leq 20$</td><td>17</td></tr><tr><td>$20 < x \leq 30$</td><td>23</td></tr><tr><td>$30 < x \leq 40$</td><td>19</td></tr><tr><td>$40 < x \leq 50$</td><td>13</td></tr><tr><td>$50 < x \leq 60$</td><td>3</td></tr></table>	Marks obtained <i>Punte behaal</i>	Frequency <i>Frekwensie</i>	$0 < x \leq 10$	5	$10 < x \leq 20$	17	$20 < x \leq 30$	23	$30 < x \leq 40$	19	$40 < x \leq 50$	13	$50 < x \leq 60$	3	17 23 19 13 3 (5)
Marks obtained <i>Punte behaal</i>	Frequency <i>Frekwensie</i>															
$0 < x \leq 10$	5															
$10 < x \leq 20$	17															
$20 < x \leq 30$	23															
$30 < x \leq 40$	19															
$40 < x \leq 50$	13															
$50 < x \leq 60$	3															
2.5	$20 < x \leq 30$	answer/ antwoord (1)														
[11]																

QUESTION/VRAAG 3																				
3.1	4 minutes/ Minute	answer/ antwoord (1)																		
3.2	$\frac{169}{10} = 16,9$ Mean/gemiddelde	169 answer/ antwoord (2)																		
3.3	Standard deviation/Standaardafwyking = 5,79	answer/ antwoord (2)																		
3.4	$(16,9 - 2 \times 5,79; 16,9 + 2 \times 5,79)$ $(5,32 ; 28,48)$ $\therefore$ 1 member of the team completed the obstacle race outside of 2 standard deviations of the mean/ 1 lid van die span voltooi die hinderniswedloop buite 2 standaard afwykings van die gemiddelde	$\bar{x} - 2\sigma$ $\bar{x} + 2\sigma$ answer/ antwoord (3)																		
3.5	$\frac{169+x+5}{20}=18$ $x = 18 \times 20 - 174$ $x = 186$	$169 + x + 5$ dividing by 20/ deel deur 20 answer/ antwoord (3)																		
[11]																				
QUESTION/VRAAG 4																				
4.1.1	50 players/spelers	answer/ antwoord (1)																		
4.1.2	$40 - 10 = 30$ players/spelers	40 and 10 answer/antwoord (2)																		
4.1.3	<table border="1"> <thead> <tr> <th>Class interval/ <i>Klas interval</i></th><th>Frequency/ <i>Frekwensie</i></th><th>Cumulative frequency <i>Kumulatiewe frekwensie</i></th></tr> </thead> <tbody> <tr> <td>$15 \leq x < 20$</td><td>4</td><td>4</td></tr> <tr> <td>$20 \leq x < 25$</td><td>9</td><td>13</td></tr> <tr> <td>$25 \leq x < 30$</td><td>24</td><td>37</td></tr> <tr> <td>$30 \leq x < 35$</td><td>10</td><td>47</td></tr> <tr> <td>$35 \leq x < 40$</td><td>3</td><td>50</td></tr> </tbody> </table>	Class interval/ <i>Klas interval</i>	Frequency/ <i>Frekwensie</i>	Cumulative frequency <i>Kumulatiewe frekwensie</i>	$15 \leq x < 20$	4	4	$20 \leq x < 25$	9	13	$25 \leq x < 30$	24	37	$30 \leq x < 35$	10	47	$35 \leq x < 40$	3	50	two correct values/ twee korrekte waardes. three correct values/ drie korrekte waardes all correct values/ alle korrekte waardes (3)
Class interval/ <i>Klas interval</i>	Frequency/ <i>Frekwensie</i>	Cumulative frequency <i>Kumulatiewe frekwensie</i>																		
$15 \leq x < 20$	4	4																		
$20 \leq x < 25$	9	13																		
$25 \leq x < 30$	24	37																		
$30 \leq x < 35$	10	47																		
$35 \leq x < 40$	3	50																		

4.2	<table><tr><th>Class interval/ <i>Klas- interval</i></th><th>Class midpoint/ <i>Klas- middelpunt</i></th><th>Frequency/ <i>Frekwensie</i></th></tr><tr><td>$15 \leq x < 20$</td><td>17,5</td><td>4</td></tr><tr><td>$20 \leq x < 25$</td><td>22,5</td><td>9</td></tr><tr><td>$25 \leq x < 30$</td><td>27,5</td><td>24</td></tr><tr><td>$30 \leq x < 35$</td><td>32,5</td><td>10</td></tr><tr><td>$35 \leq x < 40$</td><td>37,5</td><td>3</td></tr></table> Frequency polygon of the ages of soccer players/ <i>Frekwensie- veelhoek van sokkerspelers se oudermme</i> using midpoints/ middelpunte plotting the points correctly/ om die punte korrek te plot points joined by straight line/punte verbind deur reguit lyn. Grounding at/ Gronding by (12,5 ; 0) and/en (42,5 ; 0) (4)	Class interval/ <i>Klas- interval</i>	Class midpoint/ <i>Klas- middelpunt</i>	Frequency/ <i>Frekwensie</i>	$15 \leq x < 20$	17,5	4	$20 \leq x < 25$	22,5	9	$25 \leq x < 30$	27,5	24	$30 \leq x < 35$	32,5	10	$35 \leq x < 40$	37,5	3
Class interval/ <i>Klas- interval</i>	Class midpoint/ <i>Klas- middelpunt</i>	Frequency/ <i>Frekwensie</i>																	
$15 \leq x < 20$	17,5	4																	
$20 \leq x < 25$	22,5	9																	
$25 \leq x < 30$	27,5	24																	
$30 \leq x < 35$	32,5	10																	
$35 \leq x < 40$	37,5	3																	
4.3	The claim is not valid/Die eis is nie geldig nie Range of CLASS/ Omvang van Klas A = 60 Range of CLASS/ Omvang van Klas B = 40 Range of CLASS A is bigger than range of CLASS B. Therefore the marks of class A are more spread out than CLASS B/ Omvang van Klas A is groter as klas B. Daarom is die punte van klas A meer versprei as KLAS B At least 25% of class A have lower marks than any learner in CLASS B/ Ten minste 25% van klas A het laer punte as enige leerder in KLAS B CLASS A performed worse at the bottom end./KLAS A het aan die onderkant erger presteer. Claim not valid/ Eis nie geldig nie Comment on the overall spread./ Kommentaar op die algehele verspreiding. Comparison of lower values./ Vergelyking van laer waardes. (3)																		

[13]

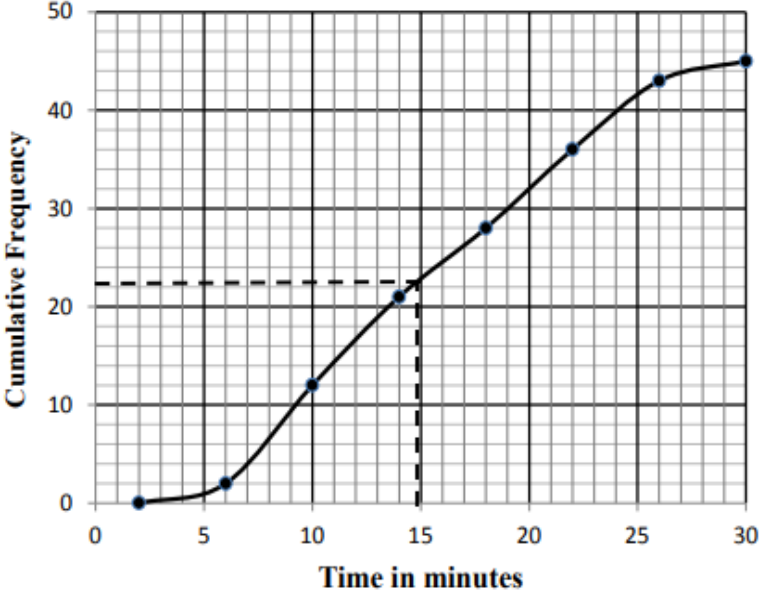
[13]

QUESTION/VRAAG 5		
5.1.1	Min = 12 $Q_1 = 17$ $Q_2 = 30$ $Q_3 = 38$ Max 65	min + max median/mediaan, Q_1 and/en Q_3 (2)
5.1.2	$IQR = Q_3 - Q_1$ $= 38 - 17$ $= 21$	answer/ antwoord (1)
5.1.3	Skewed to the right OR positively skewed/ Skeef na regs of positief skeef	Answer / antwoord (1)
5.2.1	Mean/ Gemiddeld = $\frac{439+y}{13}$ $41 = \frac{439+y}{13}$ $439 + y = 533$ $y = 94$	$41 = \frac{439 + y}{13}$ answer / antwoord (2)
5.2.2	$\sigma = 30,94$	answer/ antwoord (1)
5.2.3	$41 \times 13 = 533$ $18 \times 6 = 108$ Overall mean time/ Algemene Gemiddelde tyd: $\frac{533 + 108}{19} = \frac{641}{19} = 33,74$	108 $533 + 108 = 641$ answer/ antwoord (3)
[10]		

QUESTION/VRAAG 6

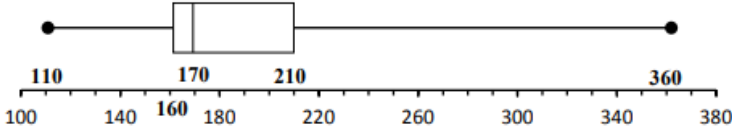
6.1	<table border="1"> <thead> <tr> <th>AGE OF PERSON SURVEYED/OUDERDOM VAN PERSOON IN OPNAME</th><th>FREQUENCY/FREKWENSIE</th><th>CUMULATIVE FREQUENCY/KUMULATIEWE FREKWENSIE</th></tr> </thead> <tbody> <tr> <td>$20 < x \leq 30$</td><td>7</td><td>7</td></tr> <tr> <td>$30 < x \leq 40$</td><td>20</td><td>27</td></tr> <tr> <td>$40 < x \leq 50$</td><td>25</td><td>52</td></tr> <tr> <td>$50 < x \leq 60$</td><td>12</td><td>64</td></tr> <tr> <td>$60 < x \leq 70$</td><td>8</td><td>72</td></tr> <tr> <td>$70 < x \leq 80$</td><td>4</td><td>76</td></tr> <tr> <td>$80 < x \leq 90$</td><td>4</td><td>80</td></tr> </tbody> </table>	AGE OF PERSON SURVEYED/OUDERDOM VAN PERSOON IN OPNAME	FREQUENCY/FREKWENSIE	CUMULATIVE FREQUENCY/KUMULATIEWE FREKWENSIE	$20 < x \leq 30$	7	7	$30 < x \leq 40$	20	27	$40 < x \leq 50$	25	52	$50 < x \leq 60$	12	64	$60 < x \leq 70$	8	72	$70 < x \leq 80$	4	76	$80 < x \leq 90$	4	80	20, 12 8, 4 52 76 (4)
AGE OF PERSON SURVEYED/OUDERDOM VAN PERSOON IN OPNAME	FREQUENCY/FREKWENSIE	CUMULATIVE FREQUENCY/KUMULATIEWE FREKWENSIE																								
$20 < x \leq 30$	7	7																								
$30 < x \leq 40$	20	27																								
$40 < x \leq 50$	25	52																								
$50 < x \leq 60$	12	64																								
$60 < x \leq 70$	8	72																								
$70 < x \leq 80$	4	76																								
$80 < x \leq 90$	4	80																								
6.2	$n = 80$	answer / antwoord (1)																								
6.3	$40 < x \leq 50$	answer/ antwoord (1)																								
6.4	Ogive/Ogief Cumulative Frequency/Kumulatiewe Frekwensie Age of person surveyed/Ouderdom van persoon in opname	grounding/ gronding (20 ; 0) upper limits/ boonste grense shape/ vorm smooth curve/ gladde kurwe (3)																								
6.5	$80 - 58 = 22$ $\frac{22}{80} \times 100 = 27,5$ accept/aanvaar: 56 – 59 calls/oproepe	58 calls/oproepe 22 27.5% (3)																								
[12]																										

SECTION/AFDELING B

1.1	45 children/ kinders	answer/ antwoord (1)																								
1.2	$\hat{x} = \frac{692}{45}$ or/of $\hat{x} = 15,38$ mins	$\hat{x} = 692 / 45$ = 15.38 min answer/ antwoord (2)																								
1.3	<table><thead><tr><th>Time taken (t) (in minutes)</th><th>Number of children</th><th>Cumulative Frequency</th></tr></thead><tbody><tr><td>$2 < t \leq 6$</td><td>2</td><td>2</td></tr><tr><td>$6 < t \leq 10$</td><td>10</td><td>12</td></tr><tr><td>$10 < t \leq 14$</td><td>9</td><td>21</td></tr><tr><td>$14 < t \leq 18$</td><td>7</td><td>28</td></tr><tr><td>$18 < t \leq 22$</td><td>8</td><td>36</td></tr><tr><td>$22 < t \leq 26$</td><td>7</td><td>43</td></tr><tr><td>$26 < t \leq 30$</td><td>2</td><td>45</td></tr></tbody></table>	Time taken (t) (in minutes)	Number of children	Cumulative Frequency	$2 < t \leq 6$	2	2	$6 < t \leq 10$	10	12	$10 < t \leq 14$	9	21	$14 < t \leq 18$	7	28	$18 < t \leq 22$	8	36	$22 < t \leq 26$	7	43	$26 < t \leq 30$	2	45	first 4 cum freq correct/ eerste 4 kum frek korrek last 3 cum freq correct/ laaste 3 kum frek korrek (2)
Time taken (t) (in minutes)	Number of children	Cumulative Frequency																								
$2 < t \leq 6$	2	2																								
$6 < t \leq 10$	10	12																								
$10 < t \leq 14$	9	21																								
$14 < t \leq 18$	7	28																								
$18 < t \leq 22$	8	36																								
$22 < t \leq 26$	7	43																								
$26 < t \leq 30$	2	45																								
1.4	CUMULATIVE FREQUENCY GRAPH (OGIVE) 	plotting cum freq at upper limits correctly (all points)/ plot kum frek by boonste perke korrek (Alle punte) shape (smooth)/ Vorm Grounding/ grond (2;0) (3)																								
1.5	On graph at the y-value of 22,5 or 23 / Op grafiek teen die y-waarde van 22,5 of 23 Median/Mediaan = ± 15 minutes/Minute.	Graph/Grafiek Answer/Antwoord (2)																								
[10]																										

QUESTION/VRAAG 2		
2.1	Number people paid R200 or less = 19 / Nommer mense betaal R200 of minder = 19	answer / antwoord (2)
2.2	$7 + 12 + a + 35 + b + 6 = 100$ $a = 40 - b$ $309 = \frac{(50 \times 7) + (150 \times 12) + (250 \times a) + (350 \times 35) + (450 \times b) + (550 \times 6)}{100}$ $309 = \frac{(50 \times 7) + (150 \times 12) + (250 \times (40 - b)) + (350 \times 35) + (450 \times b) + (550 \times 6)}{100}$ $350 + 1800 + 10000 - 250b + 12250 + 450b + 3300 = 30900$ $200b = 3200$ $b = 16$ $a = 24$ or / of $7 + 12 + a + 35 + b + 6 = 100$ $b = 40 - a$ $309 = \frac{(50 \times 7) + (150 \times 12) + (250 \times a) + (350 \times 35) + (450 \times b) + (550 \times 6)}{100}$ $309 = \frac{(50 \times 7) + (150 \times 12) + (250 \times a) + (350 \times 35) + (450 \times (40 - a)) + (550 \times 6)}{100}$ $350 + 1800 + 250a + 12250 + 1800 - 450a = 30900$ $200a = 4800$ $a = 24$ $b = 16$	$\sum x = 100$ $a = 40 - b$ $\sum fX$ $\sum \frac{fX}{n} = 309$ $200b = 3200$ (5) $\sum x = 100$ $b = 40 - a$ $\sum fX$ $\sum \frac{fX}{n} = 309$ $200a = 4800$ (5)
2.3	Modal class/ Modale klas: $300 < x \leq 400$	answer / antwoord (1)
2.4	CUMULATIVE FREQUENCY GRAPH (OGIVE) Amount spent (in Rands) on cellphone contracts per month	grounded at/ gegrond op (0 ; 0) (600 ; 100) cumulative frequencies for y-coordinates/ Kumulatiewe Frekwensies vir y-koördinate smooth shape/ vorm (4)
2.5	number of people/aantal mense = $100 - 82$ [accept/aanvaar 80 – 84 people/mense] 18 people paid more than R420 per month/ 18 mense betaal meer as R420 per maand. [accept/aanvaar 16 – 20 people/mense]	82 answer/ antwoord (2)
[14]		

QUESTION/VRAAG 3		
3.1	140 items	answer/ antwoord (1)
3.2	Modal class/Modale klas : $20 < x \leq 30$ minutes/Minute OR/OF $20 \leq x < 30$ minutes/Minute	answer/ antwoord answer/ antwoord (1)
3.3	Number of minutes taken/Aantal minute geneem = 20 minutes./Minute	answer/ antwoord (1)
3.4	140 – 126 [accept/aanvaar: 124 to/tot 128] 14 orders/bestellings (12 to/tot 16)	126 answer/ antwoord (2)
3.5	75th percentile is at 105 items/ 75ste persentiel is op 105 items =37 minutes/minute [accept/aanvaar 36 – 38 minutes/minute]	105 answer/antwoord (2)
3.6	Lower quartile is at 35 items/Laer kwartiel is op 35 items =21,5 min [accept/Aanvaar 21 – 23 min] IQR/IKW = 37 – 21,5 = 15,5 min [accept/Aanvaar 13 – 17 min]	lower quartile/ laer kwartiel (q1) answer/ antwoord (2)
[9]		
QUESTION/VRAAG 4		
4.1 a	$\bar{x} = \frac{1420}{15}$ = R94,666 = R94,67	1420 Answer/ antwoord (2)
4.1 b	$\sigma = R22,691... = R22,69$	Answer/ antwoord (2)
4.2 a	They both collected the same (equal) amount in tips, i.e. R1 420 over the 15-day period./ Hulle het albei dieselfde (gelyke) bedrag in foonitjies ingesamel, d.w.s. R1 420 oor die 15-dae tydperk.	Answer/ antwoord (1)
4.2 b	Mary's standard deviation is smaller than Reggie's which suggests that there was greater variation in the amount of tips that Reggie collected each day compared to the number of tips that Mary collected each day./ Maria se standaardafwyking is kleiner as Reggie s'n wat daarop dui dat daar groter variasie was in die hoeveelheid foonitjies wat Reggie elke dag versamel het in vergelyking met die aantal foonitjies wat Maria elke dag versamel het.	Explanation/ Verduideliking (1)
[6]		

QUESTION/VRAAG 5		
5.1.1	$\text{Mean/Gemiddeld} = \frac{2283}{12} = 190,25$ Mean profit/ Gemiddelde wins = R190 250,00 or 190,25 thousand rands/ duisend rand	sum/som. Answer/ antwoord answer in thousands of rands/ Antwoord in duisende rande (3)
5.1.2	$\text{Median/mediaan} = \frac{169+171}{2} = 170 \text{ thousand rands/ duisend rand}$ = R170 000	Answer/ antwoord (1)
5.2		Whiskers/ snor. Quartiles/ Kwartiele (2)
5.3	$\text{IQR/IKW} = Q_3 - Q_1$ $= 210 - 160 \text{ thousand rands/ duisend rand}$ $= R50\ 000$	Answer/ antwoord (1)
5.4	Skewed to the right or positively skewed./ Skeef na regs of positief skeef.	Answer/ antwoord (1)
5.5.1	$\sigma = 67,04118759 \text{ thousand rands/ duisend rand} = R67\ 041,19$	Answer/ antwoord (1)
5.5.2	$x - \sigma = 123,21 \text{ thousand rands/ duisend rand}$ For 2 months the profit was less than one standard deviation below the mean./ Vir 2 maande was die wins minder as een standardafwyking onder die gemiddelde	Lower limit/ Laer limiet Answer/ antwoord (2)
QUESTION/VRAAG 6		
6.1.1	$\bar{x} = \frac{800}{10}$ = 80	800 (add of units) Answer/ antwoord (CA if $\div 10$) (2)
6.1.2	$\sigma = 18,83$	Answer/ antwoord (2)
6.1.3	(61.17 ; 98.83) Days 1, 2, 8, 9 and 10 lie outside 1 standard deviation from the mean/ Dae 1, 2, 8, 9 en 10 lê buite 1 standaard afwyking van die gemiddelde $\therefore 5 \text{ days /dae}$	Mean – 1 SD/ Gemiddelde – 1 SA Mean + 1 SD/ Gemiddelde + 1 SA Answer/ antwoord (3)
6.2.1	Skewed to the left or negatively skewed <i>Skeef na links of negatief skeef</i>	Answer/ antwoord (1)
6.2.2	A = 65 B = 99	Answer/ antwoord Answer/ (2)
[10]		