basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 10

MATHEMATICS P2

NOVEMBER 2017

MARKS: 100

TIME: 2 hours

This question paper consists of 10 pages and a 15-page answer book.

KWAZULU-NATAL

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1.   This question paper consists of 9 questions.

2.   Answer ALL the questions in the SPECIAL ANSWER BOOK provided.

3.   Clearly show ALL calculations, diagrams, graphs, et cetera that you have used to determine the answers.

4.   Answers only will NOT necessarily be awarded full marks.

5.   Round off answers to TWO decimal places, unless stated otherwise.

6.   Diagrams are NOT necessarily drawn to scale.

7.   You must use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.

8.   Write neatly and legibly.

QUESTION 1

The data below shows the number of laptops sold by 15 sales agents during the last financial year.

43   48   62   52   46   90   58   37   48   73   84   68   54   34   78

1.1   Determine the median of the number of laptops sold.   (2)

1.2   Calculate the range of the data.   (2)

1.3   Calculate the interquartile range (IQR).   (3)

1.4   Draw a box and whisker diagram for the data above.   (3)
                                                                                               [10]

QUESTION 2

A learner did a project on climate change. At 14:00 each day, she recorded the temperature (in °C) for a certain town. The information is given in the frequency table below.

TEMPERATURE (IN °C)	FREQUENCY
$20 \leq T < 24$	2
$24 \leq T < 28$	4
$28 \leq T < 32$	9
$32 \leq T < 36$	5
$36 \leq T < 40$	7
$40 \leq T < 44$	3

2.1   For how many days did the learner collect the data?   (1)

2.2   Write down the modal class for the data.   (1)

2.3   Estimate the mean of the data.   (3)

2.4   Calculate the percentage of days on which the temperature was at least 28 °C.   (2)
                                                                                                [7]

KWAZULU-NATAL

QUESTION 3

In the diagram below, P(7 ; 4), Q(6 ; 6), R(0 ; 3) and S(t ; k) are the vertices of quadrilateral PQRS.
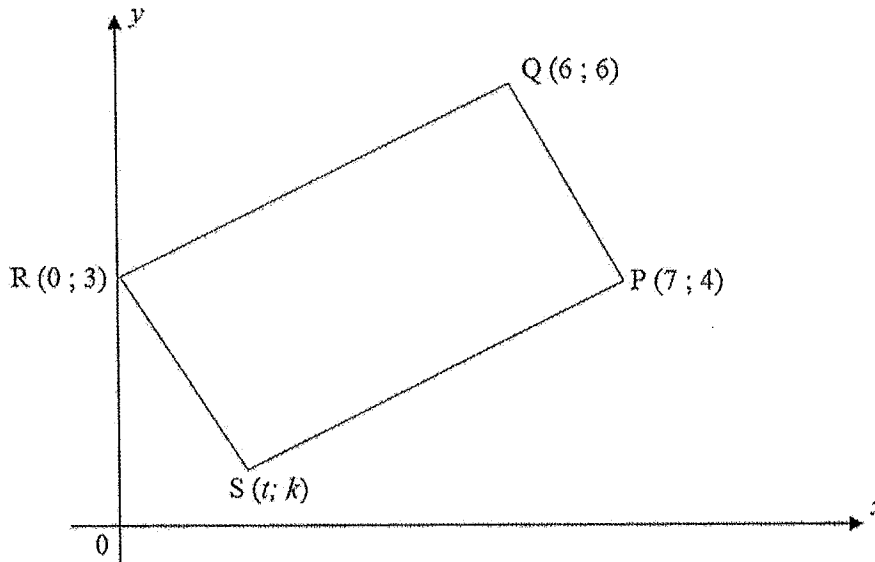
3.1   Calculate the length of PQ. Leave your answer in surd form.   (2)

3.2   If T$\left(\dfrac{7}{2} ; \dfrac{7}{2}\right)$ is the midpoint of QS, determine the coordinates of S.   (3)

3.3   If the coordinates of S are (1 ; 1), show that PR = QS.   (2)

3.4   Show that QR $\perp$ RS.   (4)

3.5   Hence, what type of special quadrilateral is PQRS? Motivate your answer.   (2)

3.6   Calculate the size of R$\hat{S}$Q.   (3)
                                                                                      [16]

QUESTION 4

4.1   Given $4\cot\theta + 3 = 0$ and $0° < \theta < 180°$.

        4.1.1   Use a sketch to determine the value of the following. DO NOT use a calculator.

            (a) $\cos\theta$ (4)

            (b) $\dfrac{3\sin\theta\sec\theta}{\tan\theta}$ (4)

        4.1.2   Hence, show that $\sin^2\theta - 1 = -\cos^2\theta$.   (3)

4.2   Simplify the following expression WITHOUT using a calculator:

        $\cos30°\tan60° + \operatorname{cosec}^2 45°\sin^2 60°$ (3)

4.3   Solve for θ correct to TWO decimal places, if

        $\dfrac{4}{3}\sin\theta = \cos37°$ and $0° \leq \theta \leq 90°$.   (2)

                                                        [16]

QUESTION 5

Given $f(x) = \sin x - 1$ and $g(x) = 2\cos x$ for $0° \leq x \leq 270°$.

5.1   Sketch, on the grid provided in the ANSWER BOOK, the graph of f and g for $0° \leq x \leq 270°$.   (6)

5.2   Write down the following:

        5.2.1   Amplitude of g (1)

        5.2.2   Range of f (2)

5.3   Use your graph to determine the following:

        5.3.1   Number of solutions to $f(x) = g(x)$ in the interval $0° \leq x \leq 270°$ (1)

        5.3.2   Value(s) of x in the interval $0° \leq x \leq 180°$ for which $\sin x = 2 + 2\cos x$ (3)
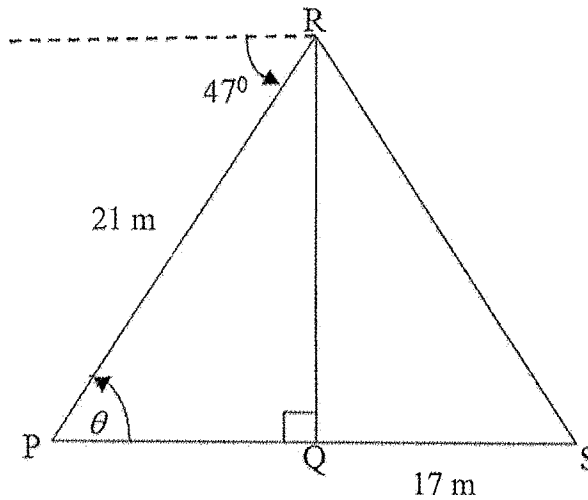
                                                            [13]

QUESTION 6

RQ is a vertical pole. The foot of the pole, Q, is on the same horizontal plane as P and S. The pole is anchored with wire cables RS and RP. The angle of depression from the top of the pole to point P is 47°. PR is 21 m and QS is 17 m. $R\hat{P}Q = \theta$.


6.1   Write down the size of θ.   (1)

6.2   Calculate the length of RQ.   (3)

6.3   Hence, calculate the size of $\hat{S}$.   (2)

6.4   If P, Q and S lie in a straight line, how far apart are the anchors of the wire cables?   (4)

                                                                                                          [10]

QUESTION 7

The diagram below shows the cross-section of a solid made up of a hemisphere placed on top of a right circular cone with radius r and slant height s. The perpendicular height of the cone, h, is 6,5 cm and the volume of the cone is 83,38 cm^3.
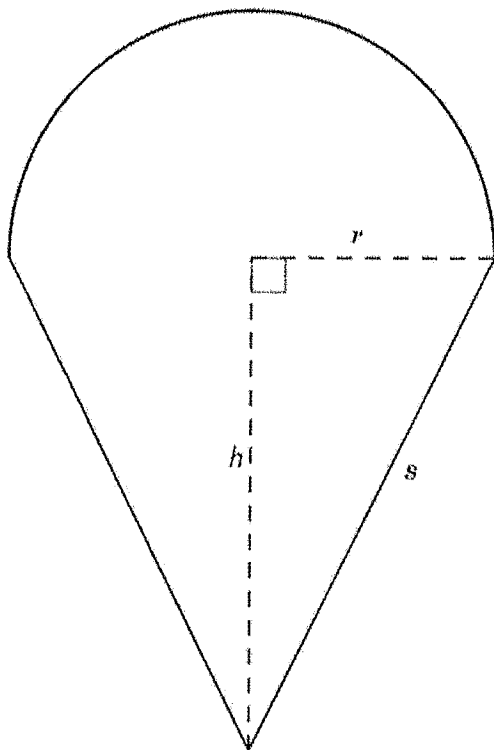
Formulae:

Surface area of sphere $= 4\pi r^2$

Volume of sphere $= \dfrac{4}{3}\pi r^3$

Surface area of cone $= \pi r^2 + \pi r s$

Volume of cone $= \dfrac{1}{3}\pi r^2 h$

Calculate, correct to TWO decimal places:

7.1 The radius, r, of the cone (2)

7.2 The slant height, s, of the cone (2)

7.3 The surface area of the solid (2)

[6]

Give reasons for ALL statements in QUESTIONS 8 and 9.

QUESTION 8

8.1   KLMN is a rhombus with diagonals intersecting at O. $L\hat{K}M = 34°$.
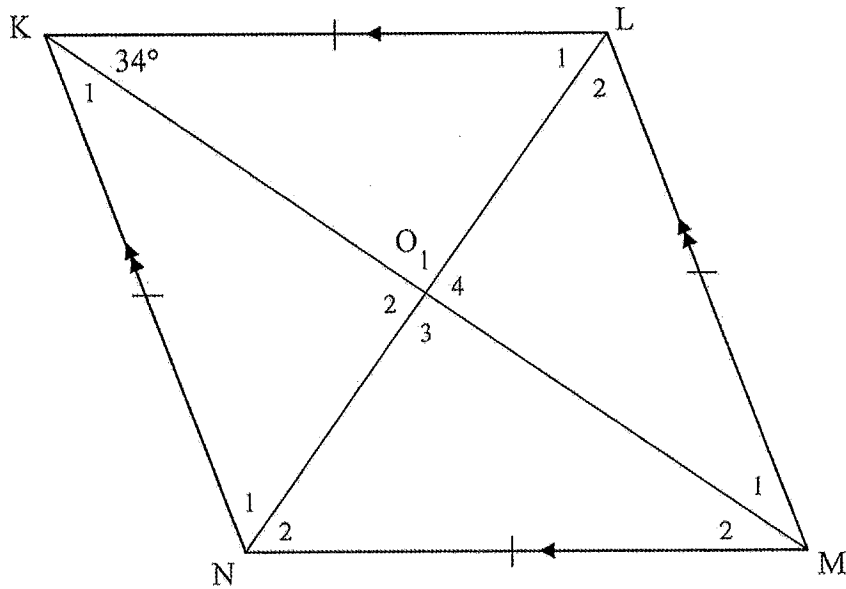
8.1.1   Write down the size of $\hat{O}_1$.   (1)

8.1.2   Calculate the size of $\hat{L}_1$.   (2)

8.1.3   Calculate the size of $K\hat{N}M$.   (2)

8.2   Given parallelogram PQRS with diagonals PR and QS intersecting at M.
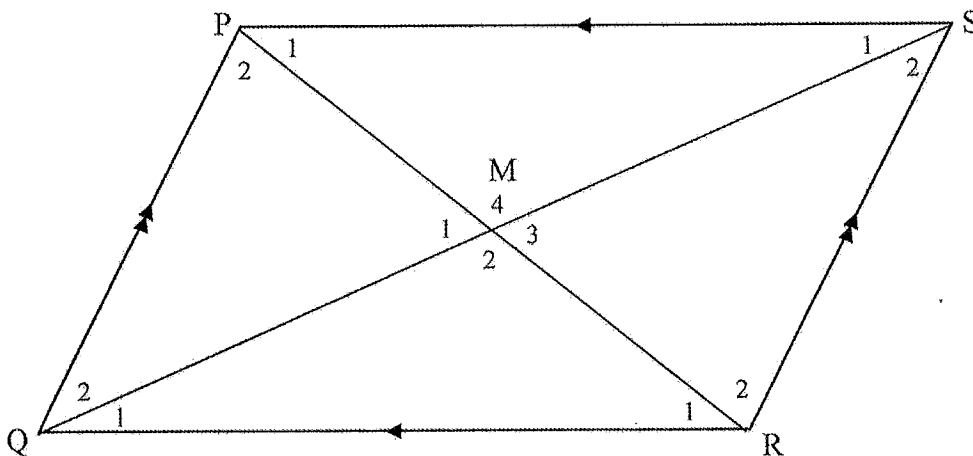
Prove that the diagonals bisect each other.   (4)

8.3 In the diagram, ABCD is a parallelogram with diagonals intersecting at E. The diagonals of parallelogram DECF intersect at G. The diagonals of parallelogram FGCH intersect at K.
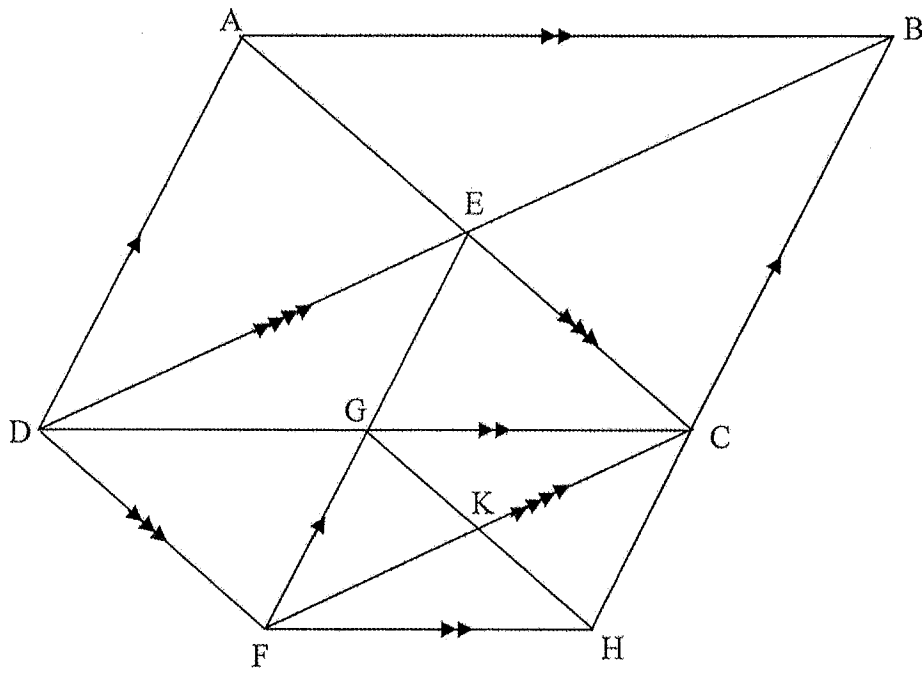
Prove that DB = 4KC. (4)

[13]

QUESTION 9

ΔABC is right-angled at B. F and G are the midpoints of AC and BC respectively.
H is the midpoint of AG. E lies on AB such that FHE is a straight line.
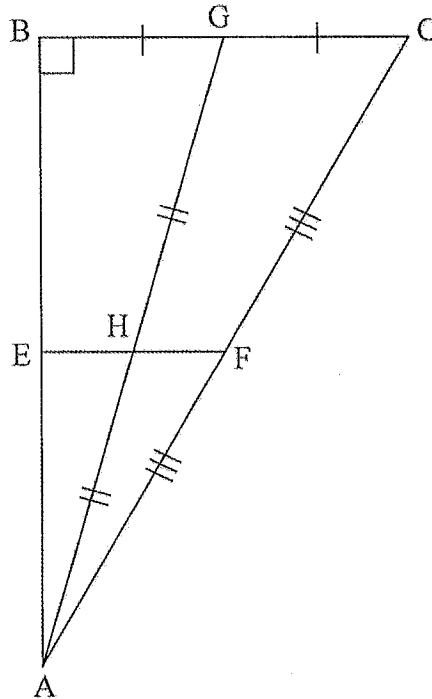
9.1 Prove that E is the midpoint of AB. (3)

9.2 If EH = 3,5 cm and the area of ΔAEH = 9,5 cm^2, calculate the length of AB. (3)

9.3 Hence, calculate the area of ΔABC. (3)

[9]

TOTAL: 100
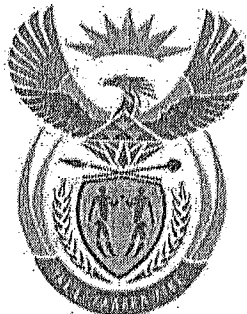
MEMO

basic education

Department:
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REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE/
NASIONALE
SENIOR SERTIFIKAAT

GRADE/*GRAAD* 10

MATHEMATICS P2/*WISKUNDE V2*

NOVEMBER 2017

MARKING GUIDELINES/*NASIENRIGLYNE*

MARKS/*PUNTE*: 100

• As per Memo discussion
 at PEC 13/11/2017

 By mr Mgauli
 (Subj. adviser

These marking guidelines consist of 10 pages.
Hierdie nasienriglyne bestaan uit 10 bladsye.

2017-01-08

Please turn over/*Blaai om asseblief*

NOTE:
- If a candidate answered a question TWICE, mark only the FIRST attempt.
- If a candidate crossed out an answer and did not redo it, mark the crossed-out answer.
- Consistent accuracy applies to ALL aspects of the marking guidelines.
- Assuming values/answers in order to solve a problem is unacceptable.

LET WEL:
- *As 'n kandidaat 'n vraag TWEE keer beantwoord het, sien slegs die EERSTE poging na.*
- *As 'n kandidaat 'n antwoord deurgehaal en nie oorgedoen het nie, sien die deurgehaalde antwoord na.*
- *Volgehoue akkuraatheid is op ALLE aspekte van die nasienriglyne van toepassing.*
- *Dit is onaanvaarbaar dat waardes/antwoorde veronderstel word om 'n probleem op te los.*

QUESTION/*VRAAG* 1 *(handwritten: NO MARK for arrangement)*

1.1	34 37 43 46 48 48 52 54 58 62 68 73 78 84 90 Median/*Mediaan* = 54	✓ arranging in ascending order/ *rangskik in stygende orde* ✓ answ./*antw.* (2)
1.2	Range/*Variasiewydte* = 90 − 34 = 56	✓ difference between max and min/ *verskil tussen maks en min* ✓ answ./*antw.* (2)
1.3	IQR(IKV) = $Q_3 - Q_1$ $\quad$ = 73 − 46 $\quad$ = 27	✓ Q_1 = 46 ✓ Q_3 = 73 ✓ answ./*antw.* (3)
1.4	*(box-and-whisker plot on number line 35–90)*	✓ min. & max./*maks.* ✓ median/*mediaan* (Q_2) ✓ Q_1 and/*en* Q_3 (3) [10]
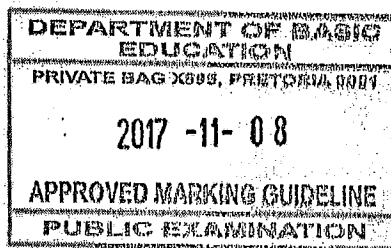
QUESTION/*VRAAG* 2

2.1	30 days/*dae*	✓ answ./*antw.* (1)
2.2	$28 \leq T < 32$ (don't penalize for Increment Notation)	✓ answ./*antw.* (1)
2.3	The mean/*Gemiddeld* $(\overline{X}) = \dfrac{2(22)+4(26)+9(30)+\ldots+3(42)}{30}$ $= \dfrac{44+104+270+170+266+126}{30}$ $= \dfrac{980}{30}$ $= 32,67^\circ C.$	✓ addition/*optel* A ✓ 30 CA CA ✓ answ./*antw.* (3)
2.4	$9+5+7+3 = 24$ days/*dae* $\%$ of number of days/*getal dae* $= \dfrac{24}{30} \times 100$ $= 80\%$	✓ addition/*optel* A ✓ answ./*antw.* CA (2)
		[7]

QUESTION/*VRAAG* 3

(*Incorrect formula → Ø*) ✱

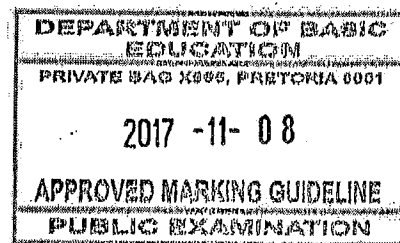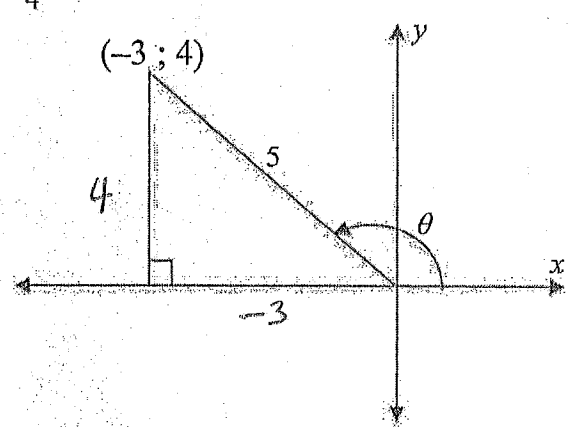|		
3.1	$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(7-6)^2 + (4-6)^2}$ $= \sqrt{(1)^2 + (-2)^2}$ $= \sqrt{5}$ *answer only: Full Marks*	✓subst. into dist formula/*verv. In afstandsformule* CA ✓ answ./*antw.* **(2)**
3.2	$\left(\dfrac{6+t}{2} ; \dfrac{6+k}{2} \right) = \left(\dfrac{7}{2} ; \dfrac{7}{2} \right)$ $\dfrac{6+t}{2} = \dfrac{7}{2}$ $\dfrac{6+k}{2} = \dfrac{7}{2}$ $t = 1$ $k = 1$ $S(1;1)$ *answer only Ø marks*	✓ $\dfrac{6+t}{2} = \dfrac{7}{2}$ ✓ $\dfrac{6+k}{2} = \dfrac{7}{2}$ ✓ answ./*antw.* CA **(3)**
3.3	$PR = \sqrt{(x_p - x_R)^2 + (y_p - y_R)^2}$ $= \sqrt{(7-0)^2 + (4-3)^2}$ $= \sqrt{50}$ (or $5\sqrt{2}$ or 7,07) $QS = \sqrt{(x_S - x_Q)^2 + (y_S - y_Q)^2}$ $= \sqrt{(1-6)^2 + (1-6)^2}$ $= \sqrt{50}$ (or $5\sqrt{2}$ or 7,07) $\therefore PR = QS$ *accept*	✓ length of PR / *lengte van PR* ✓ length of QS / *lengte van QS* **(2)**
3.4	$m_{QR} = \dfrac{6-3}{6-0} = \dfrac{1}{2}$ $m_{RS} = \dfrac{3-1}{0-1} = -2$ $m_{QR} \times m_{RS}$ $= \left(\dfrac{1}{2} \right)(-2)$ $= -1$ $m_{QR} \times m_{RS} = -1$ $\therefore QR \perp RS$ *OR T.O. Pyth in right ∠ Δ approach*	✓ $m_{QR} = \dfrac{1}{2}$ ✓ $m_{RS} = -2$ ✓ $\dfrac{1}{2} \times -2$ ✓ $m_{QR} \times m_{RS} = -1$ **(4)**
3.5	Rectangle./*Reghoek.* The diagonals are equal and one of the interior angles is equal to $90°$. *Die hoeklyne is gelyk en een van die binnehoeke is gelyk aan $90°$.*	✓Rectangle/*Reghoek* ✓reason/*rede* **(2)**

3.6	$RS = \sqrt{5}$ Opposite sides of rectangle	✓ $RS = \sqrt{5}$ A
	$\cos R\hat{S}Q = \dfrac{\sqrt{5}}{5\sqrt{2}}$	✓ $\cos R\hat{S}Q = \dfrac{\sqrt{5}}{5\sqrt{2}}$ A
	$R\hat{S}Q = 71{,}57°$	✓ answ./*antw.* CA (3)
	OR/OF	**OR/OF**
	$QR = \sqrt{(6-0)^2 + (6-3)^2} = \sqrt{45}$	✓ $QR = \sqrt{45}$ A
	$\sin R\hat{S}Q = \dfrac{\sqrt{45}}{5\sqrt{2}}$	✓ $\sin R\hat{S}Q = \dfrac{\sqrt{45}}{5\sqrt{2}}$ A
	$R\hat{S}Q = 71{,}57°$	✓ answ./*antw.* CA (3)
	OR/OF	**OR/OF**
	$QR = \sqrt{(6-0)^2 + (6-3)^2} = \sqrt{45}$	✓ $QR = \sqrt{45}$ A
	$RS = \sqrt{5}$ Opposite sides of rectangle	
	$\tan R\hat{S}Q = \dfrac{\sqrt{45}}{\sqrt{5}}$	✓ $\tan R\hat{S}Q = \dfrac{\sqrt{45}}{\sqrt{5}}$ A
	$R\hat{S}Q = 71{,}57°$	✓ answ./*antw.* CA (3)
		[16]

QUESTION/*VRAAG* 4

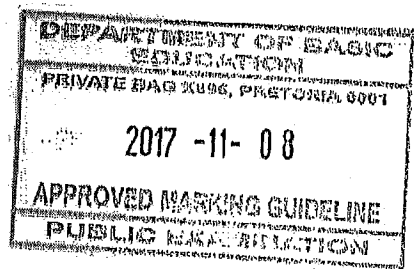|			
4.1.1 (a)	$4\cot\theta + 3 = 0$ $\cot\theta = -\dfrac{3}{4}$ (−3 ; 4), with sides 5, 4, −3, angle θ $\cos\theta = -\dfrac{3}{5}$		✓ $\cot\theta = -\dfrac{3}{4}$ A ✓ diagram A ✓ $r = 5$ A CA ✓ $\cos\theta = -\dfrac{3}{5}$ (4)
4.1.1 (b)	$\dfrac{3\sin\theta\sec\theta}{\tan\theta}$ $= 3\left[\dfrac{\left(\dfrac{4}{5}\right)\left(-\dfrac{5}{3}\right)}{-\dfrac{4}{3}}\right]$ $= 3$	[F] MUST BE POSITIVE FOR CA TO apply	✓ $\dfrac{4}{5}$ CA ✓ $-\dfrac{5}{3}$ CA ✓ $-\dfrac{4}{3}$ CA ✓ answ./*antw.* CA (4)
4.1.2	$LHS = \left(\dfrac{4}{5}\right)^2 - 1$ $= -\dfrac{9}{25}$ $RHS = -\left(\dfrac{3}{5}\right)^2$ $= -\dfrac{9}{25}$ $\therefore \sin^2\theta - 1 = -\cos^2\theta.$	If learner using Trig id. approach for proof → Full marks if correct.	✓ subst./*verv.* CA ✓ answ./*antw.* CA ✓ answ./*antw.* CA (3)
4.2	$\cos 30° \tan 60° + \cosec^2 45° \sin^2 60°$ $= \dfrac{\sqrt{3}}{2} \times \sqrt{3} + \left(\dfrac{2}{\sqrt{2}}\right)^2 \times \left(\dfrac{\sqrt{3}}{2}\right)^2$ $= \dfrac{3}{2} + \dfrac{4}{2} \times \dfrac{3}{4}$ $= \dfrac{3}{2} + \dfrac{3}{2}$ $= 3$	answer only 0 marks 2017 -11- 08	✓ any 2 ratios correct / enige twee verhoudings korrek ✓ other 2 ratios correct / ander twee verhoudins korrek ✓ answ./*antw.* CA (3)

4.3	$\dfrac{4}{3}\sin\theta = \cos 37°$		$\checkmark$ multiplying by/ A
	$\sin\theta = \dfrac{3(0,79863551)}{4}$	A	*vermenigvuldig met* $\dfrac{3}{4}$
	$\theta = 36,8°$	CA	$\checkmark$ answ./*antw.* CA (2)
			[16]

QUESTION/*VRAAG* 5

5.1	**Penalize for Each graph** if graph goes Pass the value $270°$ (-2 marks) MAX	*f* ✓shape/*vorm* A ✓ *x*-intercept/*afsnit* A ✓*y*-intercept/*afsnit* A *g* ✓shape/*vorm* A ✓*x*-intercepts/*afsnitte* A ✓*y*-intercept/*afsnit* A (6)
5.2.1	Amplitude of/*van* g $= 2$	✓answ./*antw* CA (1)
5.2.2	Range of/*Waardeversameling van* $f : -2 \le y \le 0$ CA **OR/OF** $y \in [-2 \, ; \, 0]$ CA	✓critical values/*kritieke waardes* ✓notation/*notasie* (2)
5.3.1	2 solutions/*oplossings* CA	✓answ./*antw.* (1)
5.3.2	$\sin x = 2 + 2\cos x$ $\sin x - 1 - 2\cos x = 1$ $f(x) - g(x) = 1$?? $x = 126{,}87°$ or $x = 180°$ A CA CA ONE SOLUTION [3 MARKS]	✓manipulation / *manipulasie* ✓ $x = 126{,}87°$ ✓ $x = 180°$ (3)

[13]

Ignore

QUESTION/*VRAAG* 6

6.1	$\theta = 47°$ A	✓ answ./*antw.* (1)
6.2	$\sin P = \dfrac{RQ}{RP}$ A	✓ trig. ratio/*trig. verhoud*
	$\sin 47° = \dfrac{RQ}{21}$ CA	✓ correct subst./ *korrekte instelling.*
	$RQ = 21 \sin 47°$ $RQ = 15,36 \text{ m}$ CA	✓ answ./*antw.* (3)
	OR/OF $P\hat{R}Q = 43°$	**OR/OF** ✓ trig. ratio/*trig. verhoud*
	$\cos P\hat{R}Q = \dfrac{RQ}{RP}$	
	$\cos 43° = \dfrac{RQ}{21}$	✓ correct subst./ *korrekte instelling.*
	$RQ = 21 \cos 43°$ $RQ = 15,36 \text{ m}$	✓ answ./*antw.* (3)
6.3	$\tan S = \dfrac{RQ}{QS}$	
	$\tan S = \dfrac{15,36}{17}$ CA	✓ subst into trig ratio./*verv in trig verh*
	$\hat{S} = \tan^{-1}\left(\dfrac{15,36}{17}\right)$	
	$\hat{S} = 42,10°$ CA	✓ answ./*antw.* (2)
6.4	$\cos 47° = \dfrac{PQ}{21}$ $\sin 43° = \dfrac{PQ}{21}$	✓ subst into trig. ratio/ *verv in trig. verhoud*
	$PQ = 21 \times \cos 47°$ CA $PQ = 21 \times \sin 43°$	
	$\boxed{PQ = 14,32}$ CA **OR/*OF*** $PQ = 14,32$	✓ PQ = 14,32 m
	$PS = 14,32 + 17$ $PS = 14,32 + 17$ $= 31,32 \text{ m}$ CA $= 31,32 \text{ m}$	✓ addition/*optel* MUST add ✓ answ./*antw.* (4)
	OR/OF	**OR/OF**

DEPARTMENT OF BASIC
EDUCATION
PRIVATE BAG X895, PRETORIA 0001

2017 -11- 0 8

APPROVED MARKING GUIDELINE
PUBLIC EXAMINATION

	$PQ^2 = PR^2 - RQ^2$ $\quad = 21^2 - 15,36^2$ $\quad = 205,07$ $PQ = 14,32$ $PS = 14,32 + 17$ $\quad = 31,32\text{ m}$	✓Th of Pyth/ *Stel van Pyth* ✓PQ = 14,32 m ✓addition/*optel* ✓answ./*antw.* (4)
		[10]

QUESTION/*VRAAG* 7 ⌈ W nnng formula ∅ ⌉

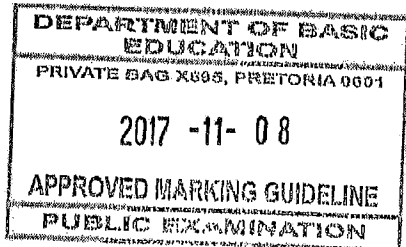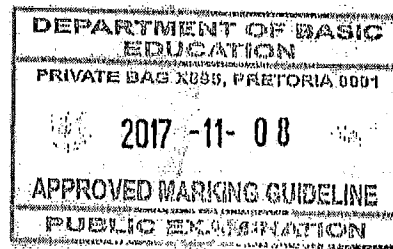| 7.1	$V = \dfrac{1}{3}\pi r^2 h$ $83,38 = \dfrac{1}{3} \times 6,5\pi\, r^2$ $r^2 = \dfrac{3 \times 83,38}{6,5\pi}$ $r = 3,50\text{ cm}$	A ✓subst./*verv.* ✓answ./*antw.* (2)
7.2	$s^2 = h^2 + r^2$ $s^2 = 6,5^2 + 3,5^2$ $s = 7,38\text{ cm}$	✓subst./*verv.* ✓answ./*antw.* (2)
7.3	Surface area of the solid/*Buite-oppervlakte (Oppervlakarea) van die vaste liggaam* $= 2\pi r^2 + \pi\, rs$ $= 2\pi(3,5)^2 + \pi(3,5)(7,38)$ $= 158,12\text{ cm}^2$	✓subst./*verv.* ✓answ./*antw.* (2)
		[6]
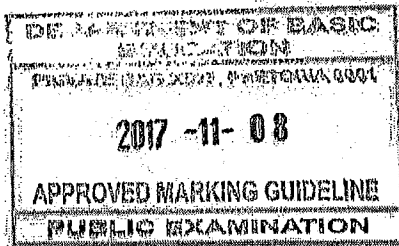
QUESTION/*VRAAG* 8 A — *Ignore Reason*

8.1.1	$\hat{O}_1 = 90°$ [Diagonal bisect at/*Hoeklyne sny by 90°.*]	✓S/R A	(1)
8.1.2	$\hat{L}_1 = 180° - (34° + 90°)$ Sum of angles in/*Som van hoeke* $\triangle$. $= 56°$	✓S CA ✓answ./*antw.* CA	(2)

8.1.3	$\hat{L}_1 = \hat{L}_2 = 56°$ diagonals bisect the/*hoeklyne sny die* $\angle$s. $\hat{L}_1 + \hat{L}_2 = \hat{N}_1 + \hat{N}_2$ opp. $\angle$s of rhombus/ *teenoorst* $\angle$*evan die ruit =* $\therefore$ KÑM $= 112°$	✓S/R CA ✓answ./*antw.* CA	(2)
	OR/OF $\hat{K}_1 = 34°$ diagonals bisect the/*hoeklyne sny die* $\angle$s. KÑM $+ 68° = 180°$ co - int angles KL $\parallel$ NM $\therefore$ KÑM $= 112°$	**OR/OF** ✓S/R CA ✓answ./*antw.* CA	(2)
	OR/OF $\hat{N}_2 = 56°$ alt angles KL $\parallel$ NM $\hat{N}_1 = \hat{N}_2 = 56°$ diagonals bisect the/*hoeklyne sny die* $\angle$s. $\therefore$ KÑM $= 112°$	**OR/OF** ✓S/R CA ✓answ./*antw.* CA	(2)

8.2	Given/*Gegee* :$\parallel^m$ PQRS with diagonals/*met hoeklyne* PR and/*en* QS. R.P.T : PM $=$ MR Proof/*Bewys* : In $\triangle$PMS and/*en* $\triangle$RMQ 1. $\hat{P}_1 = \hat{R}_1$ (alt./*verw.* $\angle$s, PS $\parallel$ QR) 2. $\hat{S}_1 = \hat{Q}_1$ (alt./*verw.* $\angle$s, PS $\parallel$ QR) 3. PS $=$ QR (opp. sides parm are /*teenoorst. sye van parm.* =) $\therefore \triangle$PMS $\equiv \triangle$RMQ (AAS) $\Rightarrow$ PM $=$ MR and MS $=$ MQ **OR/*OF***	(THEOREM) → *Bookwork* ✓ 1. S/R A ✓2. S A ✓3. S/R A ✓congruency/*kongruensie* (AAS) A (4) **OR/*OF***

Given/*Gegee* ||^m *PQRS* with diagonals/*met hoeklyne* *PR* and/*en QS*.

R.P.T : $QM = MS$

Proof/*Bewys* : In $\triangle PQM$ and/*en* $\triangle RSM$

1. $\hat{P}_2 = \hat{R}_2$ (alt./*verw.* $\angle s$, $QP \parallel SR$)
2. $\hat{S}_2 = \hat{Q}_2$ (alt./*verw.* $\angle s$, $SR \parallel PQ$)
3. $PQ = SR$ (opp. sides parm are/*teenoorst. sye van parm* =)

$\therefore \triangle PQM \equiv \triangle RSM$ (AAS)

$\Rightarrow QM = MS$ and $PM = MR$

✓ 1. S/R
✓ 2. S
✓ 3. S/R
✓ congruency/*kongruensie* (AAS)

(4)

8.3			
	$DB = 2DE$	(diagonals bisect each other)	✓ S/R
	$DE = FC$	(opp. side of/*teenoorst. sy van* //gram.)	✓ S/R
but/*maar*	$FC = 2KC$	(diagonals bisect each other)	✓ S
	$DE = 2KC$	($DE = FC$)	✓ S
	$DB = 2(2KC)$	($DB = 2DE$)	
	$DB = 4KC$		

(4)

[13]

N.B Learners approach must be relevant to answering questions in geometry
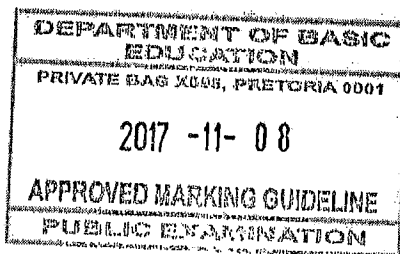
QUESTION/*VRAAG* 9

9.1	In $\triangle ACG$ F and/*en* H are midpoints/*is middelpunte* (given/*gegee*) $\therefore FH \parallel CG$ (line joining the midpoints/ *lynstuk wat middelpunte verbind*) $FE \parallel BC$ (same straight lines/*dieselfde reguitlyne*) In $\triangle AGB$, H is the midpoint/*is die middelpunt* $HE \parallel BG$ (proved/*bewys*) $\therefore E$ is the midpoint/*is die middelpunt* (Line drawn from midpt of side/*Lyn getrek vanaf midpt van sy,* // to 2nd side/*na 2de sy*)	✓ $FH \parallel CG$ ✓ reason/*rede* ✓ reason/*rede* (3)
9.2	$A\hat{E}H = A\hat{B}C = 90^0$ (Corr angle/*Ooreenst hoek* $BC \parallel EF$) In $\triangle AEH$, Area/*Oppervl.* $= \dfrac{1}{2} EH \times AE$ $9,5 = \dfrac{1}{2} \times 3,5 \times AE$ $AE = \dfrac{38}{7} = 5,43$ cm $AB = 2AE$ $AB = 2\left(\dfrac{38}{7}\right)$ $= \dfrac{76}{7}$ $= 10,86$ cm	✓ subst./*verv.* ✓ AE ✓ AB (3)
9.3	$BG = 7$ cm (line joining the midpoints/ *lynstuk wat middelpunte verbind*) $BC = 14$ cm In $\triangle ABC$, Area/*Oppervl.* $= \dfrac{1}{2} BC \times AB$ $= \dfrac{1}{2} \times 14 \times \dfrac{76}{7}$ $= 76$ cm^2	✓ S/R ✓ $BC = 2BG = 14$ ✓ answ./*antw.* (3)
		[9]

TOTAL/*TOTAAL*: 100