GR 10 MATH + MLIT.

education

Department:
Education
PROVINCE OF KWAZULU-NATAL

MATHEMATICS

COMMON TEST

MARCH 2019

MARKING GUIDELINE

NATIONAL SENIOR CERTIFICATE

GRADE 10

MARKS: 75

These marking guideline consists of 10 pages.

GRADE 10 MEMORANDUM

QUESTION 1

1.1.1	$6x^2+7x-20$ $=(3x-4)(2x+5)$	✓ $(2x+5)$ ✓ $(3x-4)$ (2)
1.1.2	x^3+x^2-x-1 $=x^2(x+1)-1(x+1)$ $=(x^2-1)(x+1)$ $=(x-1)(x+1)(x+1)$	✓ common bracket ✓ factors ✓ diff. of two squares (3)
1.2.1	$(2x+3)(5-x)$ $=10x-2x^2+15-3x$ $=-2x^2+7x+15$	✓ $-2x^2$ ✓ $+7x$ ✓ $+15$ (3)
1.2.2	$(xy^3-3)(x^2y^6+3xy^3+9)$ $=(x^3y^9-27)$	✓ x^3y^9 ✓ -27 (2)
1.2.3	$\frac{3^{2x-1}.5^{x-3}}{45^{x-2}}$ $=\frac{3^{2x-1}.5^{x-3}}{(3^2.5)^{x-2}}$ $=\frac{3^{2x-1}.5^{x-3}}{3^{2x-4}.5^{x-2}}$ $=3^{2x-1-2x+4}.5^{x-3-x+2}$ $=3^3.5^{-1}$ $=\frac{27}{5}$	✓ base as prime factors $(3^2.5)$ ✓ simplification ✓ adding and subtracting indices ✓ $3^3.5^{-1}$ or $5\frac{2}{5}$ (4)
		[14]

QUESTION 2

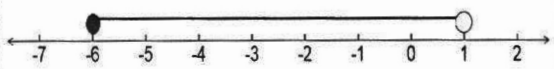
2.1	$(x-3)(x+2)=0$ $\therefore x=3$ or $x=-2$	✓✓ answers (2)
2.2	$11\times3^{2x+1}=297$ $3^{2x+1}=27$ $3^{2x+1}=3^3$ $\therefore 2x+1=3$ $2x=2$ $x=1$	✓ dividing through by 11 ✓ 3^3 ✓answer (3)
2.3	$\frac{4x^2-3x-1}{4x+1}+\frac{x^3+1}{x^2-x+1}=2$ $\frac{(4x+1)(x-1)}{4x+1}+\frac{(x+1)(x^2-x+1)}{x^2-x+1}=2$ $x-1+x+1=2$ $2x=2$ $x=1$	✓✓factors $(x+1)(x^2-x+1)$ ✓factors $(4x+1)(x-1)$ ✓ simplification ✓ answer (5)
2.4	$\pi x^2h=V$ $x^2=\frac{V}{\pi h}$ $x=\sqrt{\frac{V}{\pi h}}$	✓ dividing by πh ✓ answer (2)
		[12]

QUESTION 3

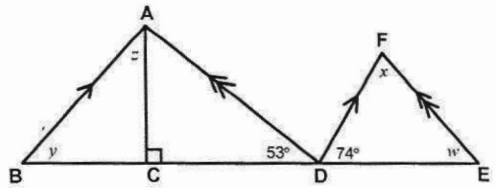
3.1	$\frac{9}{20}$	✓ answer (1)
3.2.1	$1-3x=0$ $x=\frac{1}{3}$	✓ denominator = 0 ✓ answer (2)
3.2.2	$P=\sqrt{\frac{-20(7)}{1-3(7)}}=\sqrt{7}$ $\sqrt{9}<\sqrt{7}<\sqrt{4}$ $3<\sqrt{7}<2$	✓$\sqrt{7}$ ✓ answer (2)
3.3	$x+2$	✓ answer (1)
		[6]

QUESTION 4

4.1	$4x=10-3y$ .....$(Eq1)$ $y+2x=6$ .....$(Eq2)$ $(Eq2)\times2 \rightarrow 2y+4x=12$ .....$(Eq3)$ $(Eq1) \rightarrow 3y+4x=10$ .....$(Eq4)$ $(Eq3)-(Eq4)\rightarrow -y=2$ $y=-2$ Substitute $y=-2$ into $(Eq2)\rightarrow -2+2x=6$ $2x=8$ $x=4$ **OR/OF** $4x=10-3y$ .....$(Eq1)$ $y+2x=6$ .....$(Eq2)$ $(Eq2)\times3 \rightarrow 3y+6x=18$ .....$(Eq3)$ $(Eq1) \rightarrow 3y+4x=10$ .....$(Eq4)$ $(Eq3)-(Eq4)\rightarrow 2x=8$ $x=4$ Substitute $x=4$ into $(Eq2)\rightarrow y+2(4)=6$ $y=-2$	✓multiply $(Eq2)$ by 2 ✓subtracting $(Eq3)$ and $(Eq4)$ ✓ y-value ✓ substitution of y back into Eq ✓ x-value **OR/OF** ✓multiply $(Eq2)$ by 3 ✓subtracting $(Eq3)$ and $(Eq4)$ ✓ x-value ✓ substitution of x back into Eq ✓ y-value

	OR/OF	**OR/OF**
	$4x = 10-3y$ .....$(Eq1)$ $y + 2x = 6$ .....$(Eq2)$ $(Eq2) \rightarrow y = 6-2x$ .....$(Eq3)$ Substitute $(Eq3)$ into $(Eq1) \rightarrow 4x = 10-3(6-2x)$ $4x = 10-18+6x$ $-2x = -8$ $x = 4$ Substitute $x = 4$ into $(Eq\ 3) \rightarrow y = 6-2(4)$ $y = -2$	✓ $(Eq\ 3)$ ✓Substitution of $(Eq\ 3)$ into $(Eq\ 1)$ ✓ x-value ✓ substitution of x back into Eq ✓ y-value (5)
4.2.1	$-9 \le 2x+3 < 5$ $-12 \le 2x < 2$ $-6 \le x < 1$	✓ $2x$ ✓ -6 ✓1 (3)
4.2.2		✓ answer (1)
4.2.3	$x \in [-6;1)$	✓ answer (1)
4.3	Let the first number $= x$ $\therefore$ second number $= 2x-4$ and third number $= 4x+2$ $\therefore \frac{x+(2x-4)+(4x+2)}{3} = 25$ $x+2x-4+4x+2 = 75$ $7x-2 = 75$ $7x = 77$ $x = 7$ The smallest number is therefore 7.	✓ $2x-4$ ✓ $4x+2$ ✓ equation for mean ✓ answer (4)
		[14]

QUESTION 5

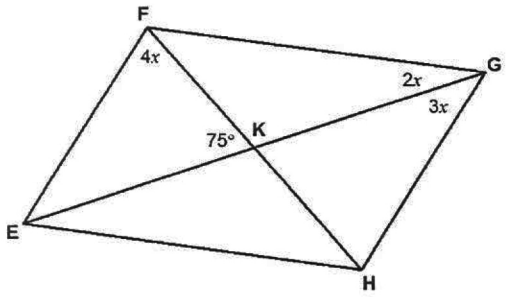
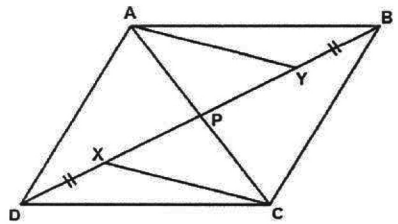
		
5.	$w = 53°$ (corresponding ∠s; AD // FE $x = 53°$ (angle sum Δ $y = 74°$ (corresponding ∠s; AB // FD $z = 16°$ (angle sum Δ)	✓ S/R ✓ S/R ✓ S/R ✓ S/R **[4]**

QUESTION 6

6.1.1	Kite	✓ answer (1)
6.1.2	Parallelogram **OR** Rectangle **OR** Square	✓ answer (any one) (1)
6.2	Rhombus **OR** Square	✓ answer (any one) (1)
6.3	Rectangle	✓ answer (1)
		[4]

GRADE 10 MEMORANDUM

QUESTION 7

7.1		
7.1.1	$F\hat{E}G = 3x$ (alternate $\angle s$; $FE // GH$) *In* ΔFEK : $4x+3x+75^\circ = 180^\circ$ (angle sum Δ) $7x = 105^\circ$ $x = 15^\circ$	✓ S/R ✓ S/R ✓ answer (3)
7.1.2	$F\hat{G}H = 5x$ $F\hat{G}H = 5(15^\circ) = 75^\circ$ $\therefore G\hat{H}E = 105^\circ$ (co – intererior $\angle s$; $FE // GH$)	✓ $F\hat{G}H = 75^\circ$ ✓ answer (2)
7.2		
	$BP = DP$ (diagonals of parm) But $BY = DX$ (given) $\therefore XP = YP$ $AP = CP$ (diagonals of parm) $\therefore AYCX$ is a parm (diagonals of parm bisect each other)	✓ S/R ✓ S/R ✓ S/R (3)
		[8]

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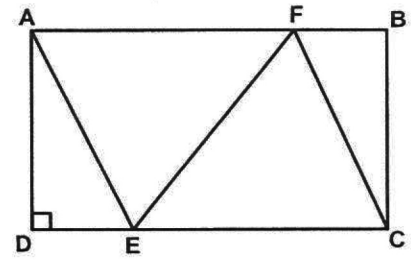
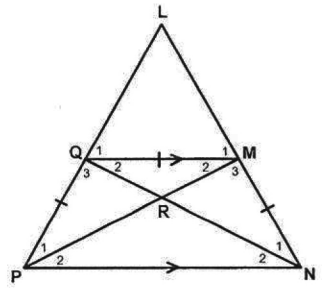
QUESTION 8

8.1		
	Let $BF = x$ $AF = AB - BF$ $\therefore AF = 16 - x$ $\therefore CF = 16 - x$ (adjacent sides of fhombus) In ΔBCF: $CF^2 = BC^2 + BF^2$ (Pythag) $(16-x)^2 = 12^2 + x^2$ $256 - 32x + x^2 = 144 + x^2$ $-32x = -112$ $x = \frac{7}{2}$ $\therefore CF = 16 - \frac{7}{2}$ $CF = 12,5\,cm$	✓ S ✓ S ✓ S/R ✓ S/R ✓ $256 - 32x + x^2 = 144 + x^2$ ✓ $x = \frac{7}{2}$ ✓ answer (7)
8.2		
8.2.1	*Let* $\hat{P}_1 = x$ $\therefore \hat{M}_2 = x$ (angles opposite = sides) $\therefore \hat{P}_2 = x$ (alternate $\angle s$; QM // PN) $\therefore \hat{M}_2 = \hat{P}_2$ $\therefore MP$ bisects $\hat{P}$	✓ S/R ✓ S/R ✓ S (3)

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8.2.2	*In* ΔPRN *and* ΔQRM $\hat{P} = \hat{M}_2$ (*alternate* $\angle s$; QM // PN) $\hat{N}_2 = \hat{Q}_2$ (*alternate* $\angle s$; QM // PN $P\hat{R}N = M\hat{R}Q$ (*vertically opposite* $\angle s$) $\therefore \Delta PRN$ /// ΔQRM ($\angle\angle\angle$)	✓ S/R ✓ S/R ✓ S/R (3)
		[13]
		TOTAL: 75

GRADE 10 MEMORANDUM

GEOMETRY • *MEETKUNDE*	
S	**A mark for a correct statement** **(A statement mark is independent of a reason)**
	'n Punt vir 'n korrekte bewering ***('n Punt vir 'n bewering is onafhanklik van die rede)***
R	**A mark for the correct reason** **(A reason mark may only be awarded if the statement is correct)**
	'n Punt vir 'n korrekte rede ***('n Punt word slegs vir die rede toegeken as die bewering korrek is)***
S/R	**Award a mark if statement AND reason are both correct**
	Ken 'n punt toe as die bewering EN rede beide korrek is