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KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

MATHEMATICS

COMMON TEST

MARCH 2022

MARKING GUIDELINE

MARKS: 75

TIME: 1½ hours

This memorandum consists of 6 pages.

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QUESTION 1

1.1	D	✓✓ answer	(2)
1.2	B	✓✓ answer	(2)
1.3	C	✓✓ answer	(2)
1.4	A	✓✓ answer	(2)
1.5	B	✓✓ answer	(2)
1.6	C	✓✓ answer	(2)
1.7	B	✓✓ answer	(2)
1.8	D	✓✓ answer	(2)
1.9	A	✓✓ answer	(2)
1.10	D	✓✓ answer	(2)
			[20]

QUESTION 2

2.1	$(a+2)(a^2-2a+8)$ $=a^3-2a^2+8a+2a^2-4a+16$ $=a^3+4a+16$	✓ expand ✓ simplification	(2)
2.2.1	x^3-y^9 $=\left[x^3-\left(y^3\right)^3\right]$ $=\left(x-y^3\right)\left(x^2+xy^3+y^6\right)$	✓ $\left(x-2y^3\right)$ ✓ $\left(x^2+xy^3+4y^6\right)$	(2)
2.2.2	$f+e-1-ef$ $=f-1+e-ef$ $=1(f-1)+e(1-f)$ $=1(f-1)-e(f-1)$ $=(f-1)(1-e)$ OR $f+e-1-ef$ $=f-ef+e-1$ $=f(1-e)+(e-1)$ $=f(1-e)-1(1-e)$ $=(1-e)(f-1)$ OR	✓ common factors ✓ common bracket ✓ answer ✓ common factors ✓ common bracket ✓ answer	(3) (3)

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	$f+e-1-ef$ $=f-ef+e-1$ $=f(1-e)+(e-1)$ $=f(1-e)-1(1-e)$ $=(1-e)(f-1)$	✓ common factors ✓ common bracket ✓ answer	(3)
2.3.1	$\frac{18^{m-2}\times 6^{-m}\times 36^{m+2}}{2^{2m+2}.3^{3n}}$ $=\frac{(2.3^2)^{m-2}\times(2.3)^{-m}\times(2^2.3^2)^{m+2}}{2^{2m+2}.3^{3n}}$ $=\frac{2^{m-2}.3^{2m-4}.2^{-m}.3^{-m}.2^{2m+4}.3^{2m+4}}{2^{2m+2}.3^{3n}}$ $=\frac{2^{m-2-m+2m+4}.3^{2m-4-m+2m+4}}{2^{2m+2}.3^{3n}}$ $=2^{2m+2-2m}.3^{3n-3n}$ $=2^2$	✓ prime bases ✓ raising powers ✓ simplification ✓ answer	(4)
2.3.2	$\frac{y^2-y-2}{y^2-4}\times\frac{y^2+2y}{y^2+y}$ $=\frac{(y-2)(y+1)}{(y-2)(y+2)}\times\frac{y(y+2)}{y(y+1)}$ $=1$	✓ factors of trinomial ✓ difference of 2 squares ✓ common factor ✓ answer	(4)
2.4	 $Area = (6x+3)(4x+2)$ $Area = (24x^2+12x+12x+6)\text{ units}^2$ $Area = (24x^2+24x+6)\text{ units}^2$	Students do not need to expand binomial x binomial ✓ $(6x+3)$ ✓ $(4x+2)$ ✓ $A=l\times w$	(3)
			[18]

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QUESTION 3

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3.1.1	$\frac{3}{x+2}+\frac{5}{x-4}=2$ $LCD:(x+2)(x-4)$ $RESTR: x\neq -2 \text{ or } x\neq 4$ $3(x-4)+5(x+2)=2(x+2)(x-4)$ $3x-12+5x+10=2(x^2-2x-8)$ $8x-2=2x^2-4x-16$ $2x^2-12x-14=0$ $2(x-7)(x+1)=0$ $\therefore x=7 \text{ or } x=-1$	✓ LCD ✓ numerator ✓ CA factors ✓ CA	(4)
3.1.2	$5^{x-4}+5^x=626$ $5^x.5^{-4}+5^x=626$ $5^x(5^{-4}+1)=626$ $5^x(5^{-4}+1)=626$ $5^x=625$ $5^x=5^4$ $\therefore x=4$	✓ common factor ✓ 625 ✓ answer	(3)
3.2	$-6\leq 2x-2<10$ $-4\leq 2x<12$ $-2\leq x<6$  	✓ $-4\leq 2x<12$ ✓ $-2\leq x<6$ ✓ number line / notation	(3)
3.3	$4a-b=5 \quad (Eq1)$ $-3a+4b=19 \quad (Eq2)$ $Eq1\times 4\rightarrow \quad 16a-4b=20$ $Eq1+Eq2 \quad \underline{-3a+4b=19}$ $13a \quad =39$ $\therefore a=3$ $Sub\ a=3\ in\ Eq1\rightarrow\ 4(3)-b=5$ $\therefore b=7$ OR	✓ $Eq1\times 4$ ✓ Adding eqs ✓ $a=3$ ✓ substitution ✓ b = 7 ✓ $b=4a-5$ ✓ $Sub\ Eq3\rightarrow Eq2$	(5)

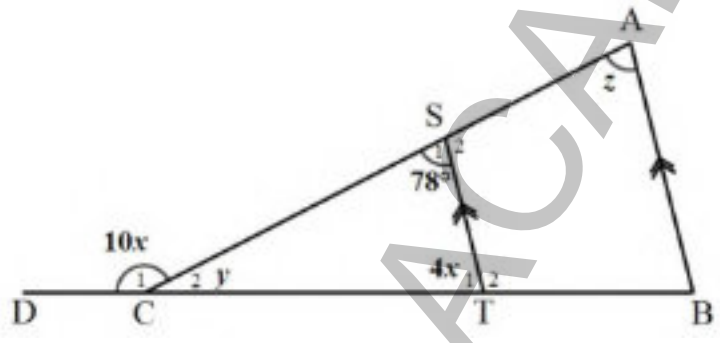
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	$4a-b=5 \quad (Eq1)$ $-3a+4b=19 \quad (Eq2)$ $Eq1 \rightarrow Eq3 \quad b=4a-5$ $Sub\ Eq3\ in\ Eq2: \quad -3a+4(4a-5)=19$ $-3a+16a-20=19$ $13a=39$ $\therefore a=3$ $Sub\ a=3\ in\ Eq1 \rightarrow 4(3)-b=5$ $\therefore b=7$	✓ $a=3$ ✓ substitution ✓ b = 7	(5)
			[15]

Give reasons for your statements in the answers to QUESTIONS 4 and 5.

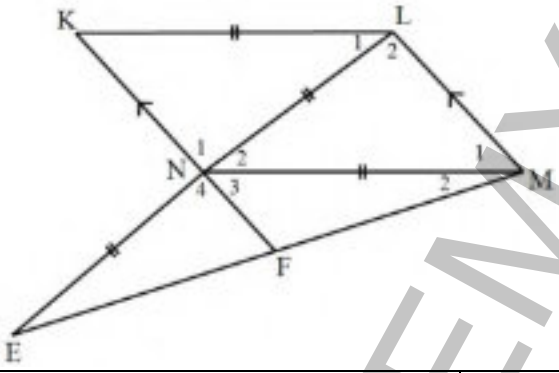
QUESTION 4

4.1	 $10x = 78° + 4x$ (ext ∠ of ΔSTC) $6x = 78^o$ $x = 13^o$ $y = 180^o - [78^o + 4(13^o)]$ (sum of ∠s ΔSTC) $y = 50^o$ OR $y = 180^o - (10 \times 13^o)$ (sum of ∠s st. line) $y = 50^o$ $z = 78^o$ (corresp ∠s; ST//AB)	✓ S ✓ R ✓ S/R ✓ S/R ✓ S/R	(4)
4.2	Rhombus Square Rectangle	✓ answer ✓ answer ✓ answer	(3)
			[7]

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QUESTION 5



5.1	$\hat{M}_1 = \hat{L}_2$ $(\angle s \text{ opp} = \text{sides})$ but $\hat{N}_1 = \hat{L}_2$ $(\text{alt } \angle s;\ KN \parallel LM)$ $\hat{N}_1 = \hat{K}$ $(\angle s \text{ opp} = \text{sides})$ $\therefore\ \hat{M}_1 = \hat{K}$	✓ S/R ✓ S/R ✓ S/R	(3)
5.2	In ΔKLN and ΔMNL: 1. LN is common 2. $\hat{K} = \hat{M}_1$ (proved above) 3. $\hat{N}_1 = \hat{L}_2$ *alt ∠s ; KN // LM* $\therefore$ ΔKLN and ΔMNL (A; A; S)	✓ S/R ✓ S/R ✓ S/R ✓ S/R	(4)
5.3	$KL = NM$ (*given*) $KN = ML$ (*congruent Δs proved above*) $\therefore$ *KLMN* is a parallelogram. Reason: 2 Pairs of opp sides equal and parallel	✓ S ✓ R ✓ S/R	(3)
5.4	$\hat{M}_1 + \hat{M}_2 + \hat{L}_2 + \hat{E} = 180°$ (*sum ∠s of ΔNME*) *but* $\hat{L}_2 = \hat{M}_1$ (*∠s opp = sides*) *and* $\hat{E} = \hat{M}_2$ (*∠s opp = sides*) $\therefore \hat{M}_1 + \hat{M}_2 + \hat{M}_1 + \hat{M}_2 = 180°$ $2\hat{M}_1 + 2\hat{M}_2 = 180°$ $2(\hat{M}_1 + \hat{M}_2) = 180°$ $\hat{M}_1 + \hat{M}_2 = 90°$ $\therefore L\hat{M}E = 90°$	✓ S/R ✓ S/R ✓ S/R ✓ substitution ✓ simplification	(5)
			[15]

TOTAL: 75

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