education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 10

MATHEMATICS

COMMON TEST

MARCH 2020

MARKING GUIDELINES

MARKS: 75

TIME: 1½ hours

This marking guideline consists of 5 pages.

QUESTION 1

1.1.1	xy^2+3x^2y $=xy(y+3x)$	✓ answer	(1)
1.1.2	$x^2-7x-18$ $=(x-9)(x+2)$	✓ $(x-9)$ ✓ $(x+2)$	(2)
1.1.3	$x^2y-16+4y-4x^2$ $=x^2y+4y-4x^2-16$ $=y(x^2+4)-4(x^2+4)$ $=(x^2+4)(y-4)$	✓ grouping ✓ common bracket ✓ answer	(3)
1.2.1	$(2x-1)(x^2-3x+1)$ $=2x^3-6x^2+2x-x^2+3x-1$ $=2x^3-7x^2+5x-1$	✓ correct expansion ✓ $-7x^2$ ✓ $+5x$	(3)
1.2.2	$\frac{x^2-1}{(x+2)+x(x+2)}\div\frac{x-1}{2x+4}$ $=\frac{(x-1)(x+1)}{(x+2)(1+x)}\times\frac{2(x+2)}{x-1}$ $=2$	✓ factorising of D.O.T.S ✓ factorising of common bracket ✓ changing ÷ ✓ answer	(4)
1.2.3	$\frac{2^{-2n}.3^{-3n}}{2^{2n}.4^{n-1}.12^{-3n}}$ $=\frac{2^{-2n}.3^{-3n}}{2^{2n}.2^{2n-2}.(2^2.3)^{-3n}}$ $=\frac{2^{-2n-2n-2n+2}.3^{-3n}}{2^{-6n}.3^{-3n}}$ $=2^{-6n+2+6n}.3^{-3n+3n}$ $=2^2$ $=4$	✓ prime bases ✓ raising powers ✓ simplification ✓ answer	(4)
			[17]

2.1.1	$x(2x-5)=0$ $\therefore x=0 \text{ or } x=\frac{5}{2}$	✓ $x=0$ ✓ $x=\frac{5}{2}$	(2)
2.1.2	$3x^2-2x-8=0$ $(3x+4)(x-2)=0$ $\therefore x=-\frac{4}{3} \text{ or } x=2$	✓ correct factors ✓ $x=-\frac{4}{3}$ ✓ $x=2$	(3)

2.1.3	$5^{2x-1}-1=0$ $5^{2x-1}=5^0$ $\therefore 2x-1=0$ $\therefore x=\frac{1}{2}$	✓ ✓	5^0 answer	(2)
2.1.4	$x=y+xy$ $x-xy=y$ $x(1-y)=y$ $x=\frac{y}{1-y}$	✓ ✓ ✓	isolate x terms factorise x answer	(3)
2.1.5	$\frac{8x^3-1}{2x-1}=1$ Restriction : $x\neq\frac{1}{2}$ $\frac{(2x-1)(4x^2+2x+1)}{2x-1}=1$ $4x^2+2x+1=1$ $4x^2+2x=0$ $2x(2x+1)=0$ $\therefore x=0$ *or* $x=-\frac{1}{2}$	 ✓ ✓ ✓ ✓	 factorising simplification factors both x values	(4)
2.2.1	$-11<-2x+1<-9$ $-12<-2x<-10$ $-6<-x<-5$ $\therefore 5<x<6$	 ✓ ✓ ✓	 $-12<-2x<-10$ values inequality "flip"	(3)
2.2.2	$25<29<36$ $\sqrt{25}<\sqrt{29}<\sqrt{36}$ $\therefore 5<\sqrt{29}<6$ Therefore $\sqrt{29}$ satisfies the inequality in 2.2.1	✓ ✓	creating inequality $\sqrt{25}<\sqrt{29}<\sqrt{36}$	(2)
				[19]

QUESTION 3

3.1	$2x-y=3 \quad Eq1$ $3x+2y=8 \quad Eq2$ $Eq1\times 2: \quad 4x-2y=6$ $Eq2: \quad 3x+2y=8$ $Eq1+Eq2: \quad 7x=14$ $x=2$ $Sub\ x=2 \text{ into } Eq1: \quad 2(2)-y=3$ $-y=-1$ $y=1$ OR $2x-y=3 \quad Eq1$ $3x+2y=8 \quad Eq2$ $Eq1\rightarrow Eq3: \quad y=2x-3$ $Sub\ Eq3 \text{ into } Eq2: \quad 3x+2(2x-3)=8$ $3x+4x-6=8$ $7x=14$ $x=2$ $Sub\ x=2 \text{ into } Eq3: \quad y=2(2)-3$ $y=1$	✓ setting up equations ✓ elimination to solve for x or y ✓ $x=2$ ✓ substitution ✓ $y=1$ ✓ setting up equation ✓ substitution ✓ $x=2$ ✓ substitution ✓ $y=1$	(5) (5)
3.2	$M^b=16$ $\therefore M^b=2^4$ $but\ M=2^{0,2}$ $\therefore \quad (2^{0,2})^b=2^4$ $\therefore \quad 0,2b=4$ $\therefore \quad b=20$	✓ $16 = 2^4$ ✓ $(2^{0,2})^b=2^4$ ✓ answer	(3)
			[8]

QUESTION 4

4.1	B	✓ answer	(1)
4.2	C	✓ answer	(1)
4.3	A	✓ answer	(1)
4.4	A	✓ answer	(1)
4.5	B	✓ answer	(1)
			[5]

QUESTION 5

5.1	$B\hat{E}F = 64°$ (*given*) $\therefore T\hat{B}E = 64°$ (*alt ∠s, DF ∥ TB*) $\therefore E\hat{M}B = 64°$ (*∠s opp = sides*) $\therefore M\hat{E}B = 52°$ (*sum ∠s Δ*)	✓ S ✓ R ✓ S/R ✓ S/R	(4)
5.2	$4x - 2 = x + 28$ (*diagonals of parm*) $3x = 30$ $x = 10$ $4y - 7 = y + 14$ (*diagonals of parm*) $3y = 21$ $y = 3$	✓ S/R ✓ $x = 10$ ✓ S/R ✓ $y = 3$	(4)
5.3	$E\hat{B}C = 40°$ (*corresponding ∠s; AD ∥ BC*) $B\hat{C}E = 90°$ (*alternate ∠s; BD ∥ EC*) $\therefore B\hat{E}C = 50°$ (*sum ∠s Δ*)	✓ S ✓ R ✓ S/R ✓ S/R	(4)
			[12]

QUESTION 6

6.1.1	$M\hat{P}R = 55°$ (*∠s opp = sides*)	✓ S ✓ R	(2)
6.1.2	$K\hat{M}L = 35°$ (adj comp ∠s)	✓ S/R	(1)
6.1.3	$M\hat{L}P = 90°$ (*prop of rect*) $M\hat{L}P = 70°$ (*opp ∠s* rhombus) $\therefore K\hat{L}P = 160°$	✓ S/R ✓ S/R ✓ S	(3)
6.2.1	*In ΔABP and ΔDCN* 1. $\hat{B} = \hat{C} = 90°$ (*prop of rect*) 2. $AP = DN$ (*given*) 3. $AB = DC$ (*opp sides of rect*) $\therefore$ ΔABP *and* ΔDCN (*RHS*)	✓ S/R ✓ S/R ✓ S/R ✓ S/R	(4)
6.2.2	$B\hat{A}P = N\hat{D}C$ (*congruent Δs proved*) $\therefore D\hat{A}E = A\hat{D}E$ (*adj compl ∠s*) $\therefore AE = DE$ (*sides opp = ∠s*)	✓ S/R ✓ S ✓ R ✓ S/R	(4)
			[14]
		TOTAL MARKS:	**75**