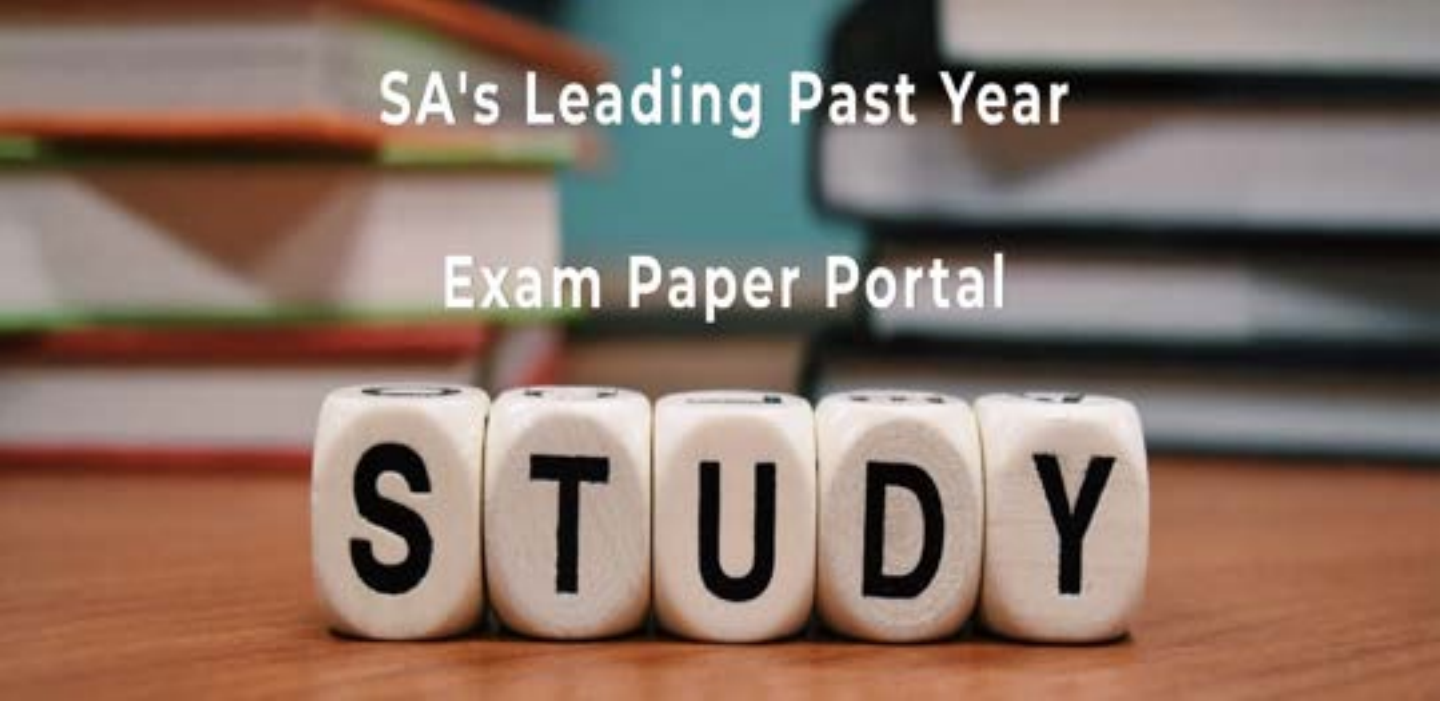

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EASTERN CAPE
Department of Education

OR TAMBO INLAND DISTRICT

GRADE 12

MATHEMATICS CONTROLLED MARKING GUIDELINE

TERM 1 2021

Marks: 50

This MARKING GUIDELINE consists of 5 pages including cover page

NOTE:
- If a candidate answers a question TWICE, mark the FIRST attempt ONLY.
- Consistent accuracy applies in ALL aspects of the marking guideline.
- If a candidate crossed out an attempt of a question and did not redo the question, mark the crossed-out attempt.
- The mark for substitution is awarded for substitution into the correct formula.

QUESTION 1		
1.1.1	$T_5 = 0{,}625$ OR $\frac{5}{8}$	✓ answer (1)
1.1.2	$T_n = 10\left(\frac{1}{2}\right)^{n-1}$ *OR* $20\left(\frac{1}{2}\right)^{n}$	✓✓ answer (2)
1.1.3	$-1 < r < 1$ $\therefore -1 < \frac{1}{2} < 1$	✓✓answer (2)
1.2	$S_{20} = 20(20+1)(20+2) = 9240$ $S_{19} = 19(19+1)(19+2) = 7980$ $T_{20} = S_{20} - S_{19}$ $\therefore T_{20} = 1260$	✓S_{20} ✓S_{19} ✓T_{20} (3)
1.3	$\sum_{k=1}^{\infty}\left(\frac{1}{3}\right)^{k} = \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + \ldots$ $S_{\infty} = \frac{\frac{1}{3}}{1-\frac{1}{3}} = \frac{1}{2}$ $\sum_{k=2}^{40} 5 = 5 + 5 + 5 + \ldots + 5$ $n = 40 - 2 + 1 = 39$ $S_{39} = 5(39) = 195$ *or* $S_{39} = \frac{39}{2}(5+5) = 195$ $S_{\infty} - S_{39}$ $= \frac{1}{2} - 195$ $= \frac{-389}{2}$ OR -194,5	✓ substitution ✓S_{∞} ✓S_{39} ✓$S_{\infty} - S_{39}$ ✓answer (5)

1.4	$1;1+d;1+2d;...$ $1;r;r^2;...$ $r=1+d.....(1)$ $r^2=1+2d.....(2)$ sub.(1)in(2) $(1+\mathrm{d})^2=1+2d$ $1+2d+d^2=1+2d$ $d^2=0$ $\therefore d=0\ and r=1$ $\therefore 1;1;1;...$Arithmeticsequence $1;1;1;...$geometricsequence He is correct	✓ eqn (1) and (2) ✓ substitution ✓ comm. diff ✓ comm. ratio ✓conclusion (5)
		(18)
QUESTION 2		
2.1.1	$\frac{QS}{PS}=\frac{3}{5}$ $\mid Line//toonesideof a\Delta\ OR\ prop.theorem, ST//PV$	✓ S ✓R (2)
2.1.2	$lenght: QS=3a\ \ and\ \ QP=8a$ $Area\Delta PQR=\frac{1}{2}\times QP\times QR\ sin\hat{Q}$ $=\frac{1}{2}\times 8a\times 11\ sin\hat{Q}$ $=44a\ sin\hat{Q}$ $Areaofaquad PSTR=Areaof\Delta PQR-Area\Delta SQT$ $=44\ xsin\hat{Q}-\frac{1}{2}\times 3a\times 3\ sin\hat{Q}$ $=\frac{79a}{2}sin\hat{Q}$ $\frac{Area\Delta PQR}{Areaofquad PSTR}=\frac{44a\ sin\hat{Q}}{\frac{79}{2}a\ sin\hat{Q}}=\frac{88}{79}$	✓ area ΔPQR ✓ area ΔSQT ✓area of a Quad PSTR ✓ ratio ✓ answer (5)

2.2.1	$\hat{D}_1 = \hat{A}_1 = x$ $\quad tan\ chord\ theorem$ $\hat{D}_3 = \hat{A}_1 = x$ $\quad Alt. < 's;\ AB//ED$ $\hat{D}_3 = \hat{D}_2 = x$ $\quad = chords =< 's\ \ OR$ $< 's\ subtended\ \ by = chords$	✓ S & R ✓ S & R ✓ S & R (3)
2.2.2	$A\hat{E}D = \hat{B}_2$ $\quad \mid Ext. < of\ a\Theta\ quad$ $\hat{D}_3 = \hat{D}_1$ $\quad \mid provenin\ 2.2.1$ $\hat{A}_1 = \hat{C}_1$ $\quad \mid sumof <'sina\Delta$ $\therefore \Delta DEA \mid\mid\mid DBC \quad \mid \ AAA$	✓ S &R ✓ S & R (2)
2.2.3 (a)	$In\ \Delta DBC\ and\ \Delta ADC$ $\hat{D}_1 = \hat{A}_2$ tan $chord\ theorem$ $\hat{C} = \hat{C}$ $\quad common <$ $\hat{B}_2 = A\hat{D}C$ $\quad sum\ of\ < 's\ in\ a\ \Delta$ $\therefore \Delta DBC \mid\mid\mid \Delta ADC \quad AAA$ $\frac{DB}{AD} = \frac{BC}{DC} \quad \mid\mid\mid\mid \Delta's$ $\therefore DC = \frac{BC \times AD}{DB}$	✓S & R ✓$\Delta DBC \mid\mid\mid \Delta ADC$ ✓ prop theorem (3)
2.2.3 (b)	$DB = AE \quad chords\ subt.\ by =<'s$ $But\ \Delta ADC \mid\mid\mid \Delta DBC$ proved in 2.2.3 (a) and $\Delta DEA \mid\mid\mid \Delta DBC$ proved in 2.2.2 $\therefore \Delta ADC \mid\mid\mid \Delta DEA \quad both \quad \mid\mid\mid \Delta DBC$ $\frac{AD}{DE} = \frac{DC}{EA} \quad \mid\mid\mid\mid \Delta's$ $EA = \frac{DC \times DE}{AD}$	✓ S & R ✓$\Delta ADC \mid\mid\mid \Delta DEA$ ✓ prop theorem (3)

2.2.4	$EA = \left(\frac{BC \times AD}{DB}\right)\left(\frac{DE}{AD}\right)$ $EA = \frac{BC \times DE}{EA} \qquad since\ DB = EA$ $EA^2 = BC \times DE$	✓ substitution ✓ EA (2)
		(20)
QUESTION 3		
3.1.1	$r = 13$ $\cos\alpha = \frac{-5}{13}$	✓answer (1)
3.1.2	$tan(180° - \alpha)$ $= -tan\,\alpha$ $= -\left(\frac{-12}{-5}\right)$ $= -\frac{12}{5}$	✓ $-tan \propto$ ✓answer (2)
3.2	$\frac{\sin(x-180°).\cos(x-90°)}{\cos(-x-360°)\sin(90° + x)}$ $= \frac{-\sin x.\sin x}{\cos x.\cos x}$ $= -\frac{\sin^2 x}{\cos^2 x}$ $= -\tan^2 x$	✓ $-sinx$ ✓$sinx$ ✓ $cosx$ ✓ $cosx$ ✓$-\frac{sin^2x}{cos^2x}$ ✓$-tan^2x$ (6)
3.3	$\sin(A+B) = \cos(90° - (A+B))$ $= \cos((90° - A) - B))$ $= \cos(90° - A)\cos(B) + \sin(90° - A)\sin(B)$ $= sinAcosB + cosAsinB$	✓correct co-function ✓regrouping ✓simplification (3)
		(12)
	TOTAL	**[50]**