education

Department:
Education
PROVINCE OF KWAZULU-NATAL

NATIONAL SENIOR CERTIFICATE

GRADE 10

MATHEMATICS

COMMON TEST

SEPTEMBER 2019

MARKING GUIDELINE

MARKS: 75

TIME: 1½ hours

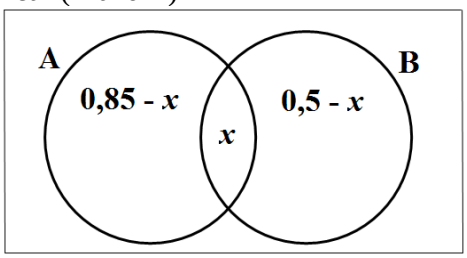
This marking guideline consists of 6 pages.

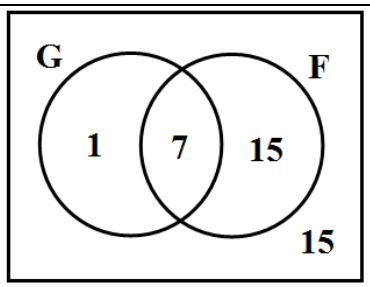
QUESTION 1

1.1.1	Deposit = $= \frac{12}{100} \times R4999$ $=$ **R599,98**	(2)
1.1.2	Monthly instalment $= \frac{R6\ 598,68}{24}$ $=$ **R 274,95**	(1)
1.1.3	Total paid = R 599,98 + R 6 598,68 $=$ **R 7 198,66**	(2)
1.1.4	$A =$ $R6598,68$ $P =$ $R4399,00$ $n =$ 2 years $i =$? $A = P(1+i \times n)$ $i = \frac{\frac{A}{P}-1}{n}$ $i = \frac{\frac{6598,68}{4399}-1}{2}$ $i = 0,25$ $\therefore$ **interest rate = 25%**	(3)
1.2	United States $\$1 = R14,75$ $\therefore$ $\$0,85 = R12,54$ United Kingdom $£1 = R18,77$ $\therefore$ $£1,30 = R24,40$ Petrol would be cheapest in the **United States**.	(3)
1.3	$A =$ $R85000$ $P =$? $n =$ 8 years $i =$ 14% $A = P(1+i)^n$ $P = \frac{A}{(1+i)^n}$ $P = \frac{85000}{(1+0,14)^8}$ **P = R 29 797,52**	(3)

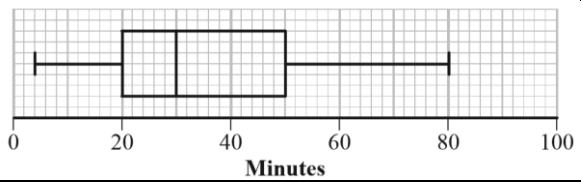
1.4	$A=$? $P=$ 2560000 $n=$ 2 years $i=$ 5,25% $A=P(1+i)^n$ $A=2560000\left(1+\frac{5,25}{100}\right)^2$ $A=2835856$	(3)
		[17]

QUESTION 2

2.1.1	$P(\text{pink})=0$	(1)
2.1.2	$P(\text{blue})=\frac{5}{20}=\frac{1}{4}$ OR 25% OR 0,25	(1)
2.1.3	$P(\text{numbered 3})=\frac{4}{20}=\frac{1}{5}$ OR 20% OR 0,2	(1)
2.2.1	P(A and B) = 0	(1)
2.2.2	Let P(A and B) = x  $(0,85-x)+(x)+(0,5-x)=1$ $1,35-x=1$ $-x=-0,35$ $x=0,35$ Therefore **P(A and B) = 0,35**	(4)
2.3.1	P(A or B)	(1)
2.3.2	P(A')	(1)
2.3.3	P(A and B)'	(1)
2.3.4	P(A and B)	(1)

2.4.1		(3)
2.4.2	15 learners	(1)
2.4.3 (a)	P(German only) = $\frac{1}{38} = 0,0263 = 2,63\%$	(1)
2.4.3 (b)	P(did NOT study French) = $\frac{16}{38} = \frac{8}{19} = 0,42 = 42\%$	(1)
		[18]

QUESTION 3

		
3.1.1	30 minutes	(1)
3.1.2	25%	(2)
3.2.1	Range = 80 – 4 = 76 minutes	(2)
3.2.2	IQR = 50 – 20 = 30 minutes	(2)
		[7]

QUESTION 4

4.1	Continuous	(1)
4.2	$a = 20$ $b = 30$	(2)
4.2	85 teachers	(1)
4.3	$20 < x \leq 30$	(1)
4.4	Estimated mean $= \frac{(15\times5)+(20\times15)+(30\times25)+(10\times35)+(10\times45)}{85}$ = **22,65**	(3)
4.5	Estimated median = **25km**	(1)
		[9]

QUESTION 5

5.1.1	$\tan 44,3° = \frac{DC}{12m}$ $DC = 12\tan 44,3°$ $DC = 11,71m$	✓tan ratio ✓ simplification ✓A (3)
5.1.2	$AC = 2 \times DC = 23,42m$ $\tan A\hat{B}C = \frac{23,42}{12}$ $A\hat{B}C = 62,87°$ $\therefore \theta = 62,87° - 44,3° = 18,57°$ *therefore spotlight will need to swing* $18,57°$ *further*	✓CA based on *DC* (5.1.1) ✓CA value for $A\hat{B}C$ ✓CA ($A\hat{B}C - 44,3°$) (3)
5.2.1	$TR^2 = TQ^2 + QR^2$ (*pythagoras*) $TR = \sqrt{12^2 + 12^2}$ $\boldsymbol{TR = 12\sqrt{2}\,cm}$	(3)
5.2.2	$NM^2 = NR^2 - MR^2$ (*pythagoras*) $NM = \sqrt{9^2 - \left(6\sqrt{2}\right)^2}$ $\boldsymbol{NM = 3\,cm}$	(2)
5.2.3	$\tan N\hat{T}R = \frac{3}{6\sqrt{2}}$ $\boldsymbol{N\hat{T}R = 19,47°}$	(3)
		[14]

QUESTION 6

6.1.1	Volume of sphere $= \frac{4}{3}\pi r^3$ $= \frac{4}{3}\pi (15)^3$ $= \mathbf{14137,17\,cm^3}$	(2)
6.1.2	Volume of water $= V_{cylinder} - V_{sphere}$ $= \pi r^2 h - \frac{4}{3}\pi r^3$ $= \pi (45)^2 (80) - 14137,17$ $\mathbf{= 498\,800,84\,cm^3}$	(3)

6.1.3	$h = \frac{\text{Volume of } water}{\pi r^2}$ $h = \frac{498800,84}{\pi(45)^2}$ $\boldsymbol{h = 78,41\,cm}$	(3)
6.2	$V = \frac{1}{3}\pi r^2 h$ $r = \sqrt{\frac{3V}{\pi h}}$ $r = \sqrt{\frac{3(14137,17)}{\pi(25)}}$ $\boldsymbol{r = 23,24\,cm}$	(2)
		[10]

TOTAL: 75