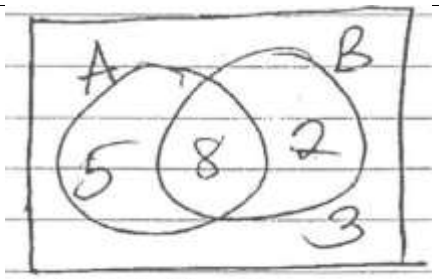
WAKISSHA
MARKING GUIDE
Uganda Certificate of Education
MATHEMATICS 456/2

No.	SOLUTIONS	MARKS	COMMENTS
1.	$F12 = \{1,2,3,4,6,12\}$ $F18 = \{1,2,3,6,9,18\}$ $30 = \{1,2,3,5,6,10,15,30\}$. HCF _ 6	B1 B1 B1 B1 04	for factors of 12 for factors of 18 for factors of 30
2.	Cost price of bicycle 90 of x -180,000 100 $x = \frac{180,000 \times 100}{90}$ Shs 200,000	Ml 04	For 90 Correct expression simplification
3.	$2\sqrt{3} \times 49 - \sqrt{81} \times 3 + \sqrt{25} \times 3$ 1403-96+56 1905-96	Ml Ml	For factorization Simplification simplification
4.	 n (e) =5+10+3 =18	133	For all entries correct B2 if one entry is wrong Bl if two entries are wrong BO if more than 2 are wrong.

5.	$y = \cdots x$ Grad of line 5/3 $\frac{5-y}{4-7} \quad \frac{5}{3}$ $\frac{y}{} \quad 15$ 3y=30 y=10		Obtaining grad of the Correct expression s Simplification

I

6.	$P \propto \frac{1}{q^2}$ or $P\frac{K}{Q^2}$ $K = 5(2^2) = 20$ $\frac{20}{(10)2} \quad 0.2$	Ml Al	c'SK Cao
7.	Let $K = 3x^2$ 1 $\Leftrightarrow 3x^2 = K+1$ $x^2 = (k+1)/3$ $x = \sqrt{\frac{k+1}{3}}$ $g^{-1}(x) = \frac{\sqrt{x+1}}{3}$3 g-l (47) = 47 3 16	Ml 04	formular transformation Correct inverse C's $g^{-1}(x)$ for both correct Cao

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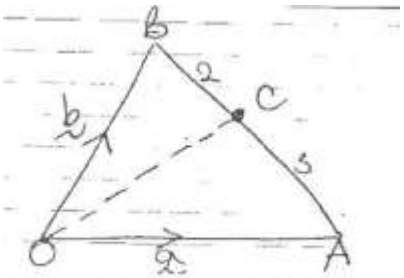
8.	$2^{3x} = \frac{1}{2}$ or $2^{2} 4$ $2^{3} \quad 3$ 2 3	Ml Ml Ml 04	Correct indices Equating Simplification
9.	3 +—vol.scale factor 9 ...LS.F = 3Ci 20 x = 60	Ml MI 04	Obtaining correct V.S.F For LSF Correct expression
10.	 3CB $= 2AC \Rightarrow AC = \frac{3}{5}AB$ $=OA + AC$ $=\underset{\sim}{a} + \frac{3}{5}(-\underset{\sim}{a} + \underset{\sim}{b})$ $=\underset{\sim}{a} - \frac{3}{5}\underset{\sim}{a} + \frac{3}{5}\underset{\sim}{b}$ OC $=\frac{2}{5}\underset{\sim}{a} + \frac{3}{5}\underset{\sim}{b}$	m 04	Correct sketch Correct interpretation Simplification

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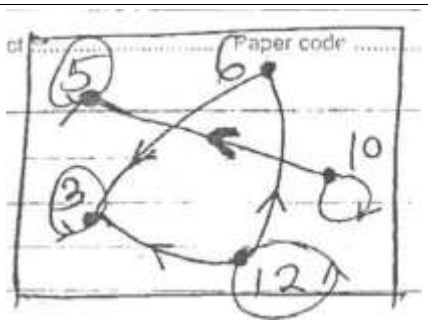
11 a)			If all four arrows correctly drawn B2 if one is wrong Bl of two are wrong BO if more than 2 wrongs For arrows mapping of itself
b)	Let K 2x-3 $-31 = x+5$ 2xk—3k=x+5 2xk-x=5+3k $x(2k-1)=5+3k$ 5+3k 2k-1 $\therefore f(x) =$ 5+3x 2x-1 $f(-1/3) = \frac{5+3(-1/3)}{2(-\frac{1}{3})-1}$ 5-1 $(-\frac{5}{3})$ $=-12/5$	Ml Ml	formulae transformation for correct f (x) C'S f(x)
c)	gh (x)$=(x-3)^2+1$ = x ^{2} —6x+10 hg(x)=x2+1-3 x ^{2} 6x+10=x ^{2} —2 - 6x+10 = x^2 —2	Ml 12 marks	2 Accept -2—, 2 4 5 Correct gh(x) Correct hg (x) simplification

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12 (a)	Num.— x - $+\frac{8}{5}\Big) = \frac{6}{5} \times \frac{57}{20} = \frac{342}{100}$ 25 4 100 Den. — x - — 39 $\frac{\frac{6}{5} of \left(\frac{5}{4}+\frac{8}{5}\right)}{\frac{25}{3}+\frac{9}{4}} = \frac{342}{100} \Big/ \frac{100}{100/27}$ 0.9234	Ml Ml Ml	simplification correct numerator simplification correct deno simplification
(b)	$\frac{(\sqrt{3}+\sqrt{2})(\sqrt{5}-\sqrt{2})}{(\sqrt{5}+\sqrt{2})(\sqrt{5}-\sqrt{2})}$ $= \frac{\sqrt{15}+\sqrt{10}-\sqrt{6}-\sqrt{2}}{5-2}$ $\frac{3.873+3.162-2.450-2}{3}$ $\frac{7.035-4.450}{3}$ $\frac{2.585}{3}$ = 0.86	Ml Ml Ml MI Ml 12	rationlzate mult by for — NE) both. correct exp. of Num correct exp. of Den simplification divide 2.585/3

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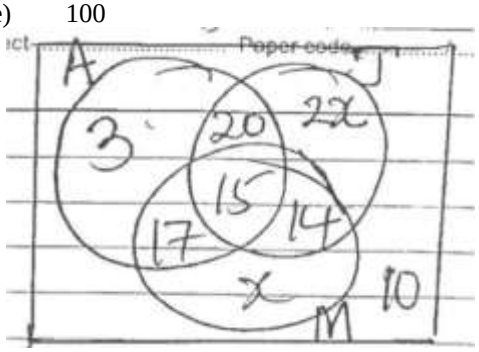
13.	n(e) 100  3x+14 = 35 3x=21		If all entries are Correctly filled. B3 If one is wrong B2 if two are wrong Bl if more than two -solving any eqtn. to obtain value of x Value ofx
(b)	$n(J) = 49 + 21$ =70 Students $n(A') = 100 - 55$ 45 Students	Ml Al	
(ii)	(100-15) P (Atmost2) 100	Ml	
(c)	100	Ml	Addition or any correct expression used
		12	ept 0.85/17 20
14i) ii)	$\overrightarrow{AB} = -a+b$ OR= OA +, $= a + \frac{1}{3}(-a$ $= \frac{2}{3}a + \frac{1}{3}b$ OA +AR -g +12)	m Ml 1	for AR = I AB Simplification
iii)	AT=a+ 12b	MI	Follow through correct route

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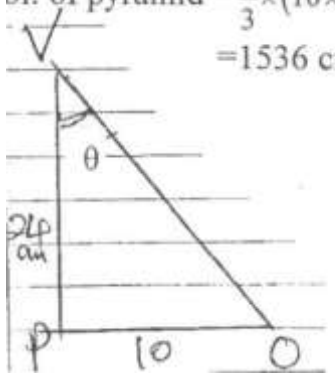
14b	OC= t(2/3 a+ ,13b) OC _ OA+AC =a+K(-a+1/2 b) =a+(1-K)+1/2 bK I-K= 2 3t and 1/3t 12K 2t-3k=0 4t=1=8t=%	1 Ml Ml Al 12	Correct equating of Coeffof a +12 solution equation Value t Value of K
15(i)	$PQ^2 = 20^2-12^2$ = 400-144 - 256 .•.PQ = 16cm	Ml 1	For exp. PQ^2
	ol. of pyramid $=\frac{1}{3}\times(16\times12)\times12$ $=1536\ cm^3$	Ml	Simplification
(ii)	 pyramid	Ml	Identifying the angle simplification
	24 tan 0 = 10 Tan O _ _ 24 o =22.6x2		

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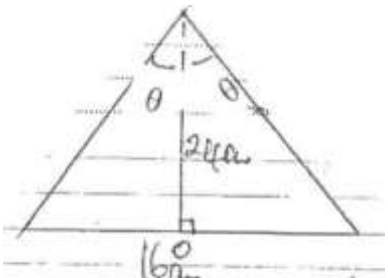
	45.240		
(iii)	 24 $\tan\theta = \theta = D \tan\theta = 8/24$ $\theta = \tan^{-1}(8/24) = 18.4349$ $\theta = 18.4349 \times 2$ $= 36.870$	Ml 12	identification of angle for doubling of Angle

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16(a)	d Time taken by cyclists 60 (240 -d) Time taken by motorist 80 d 09.45+ = 240-d 10.50 + 60 8 d 240-d 65 60 80 60 4d-3(240-d)-13 240 12 7d-+ 720 = 260 7d =980 D 140Km Time they by-pass 09:45+2:20 or 10:50 +1:15 12:05pm (c) Arrival Times Cyclist: 1345hrs or 1:45pm Motorist : 13 50hrs Or 1:50pm Diff is time of Arrival 13:50hrs 13:45 hrs 00:05minutes	B1 Ml Ml Ml Al Ml BI 12mks	- Correct expn - Correct expn - Equating Simplification (collecting like terms) Simp(same LCM) Simplification Aft. Motorist rotue 10:50 +1:15 12:05Pm Obtaining times of arrival subtraction

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176)	Amount %age Tax 230,000 0% 0 300,000- 8% 8 x 300, 000 100 = Shs 24,000 315,000 15% 15 015, 000 100 Shs47,250 Total tax Shs 71,250 Net Income per month 845,000 -71,250 hs773,750 Net Y P.a 773,750 x 12 Shs. 9,285,000	Ml	For both Addn For total tax Subtraction

(b)	Duty $\frac{25}{100} \times 20,500,000 = 5,125,000$	B1	For duty
	Value duty $\Rightarrow$ 20,500,000 +5,125,000	M1	Addition
	Purchase tax $\Rightarrow \frac{10}{100} \times 25,625,000$	A1	For value obtained
	= Shs 2,562,500	B1	Tax
	Total levied shs (5,125,000 + 2,562,500)	M1	Addition
	= Shs 7,687,500	A1	
		12	

END

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