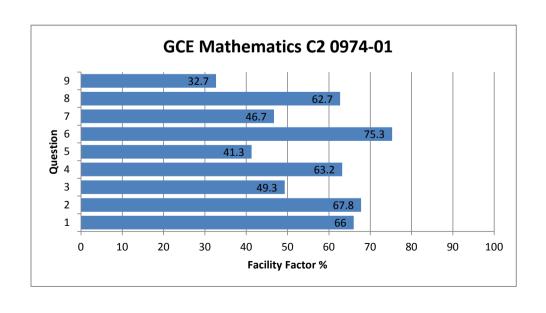


WJEC 2014 Online Exam Review

GCE Mathematics C2 0974-01

All Candidates' performance across questions

?	?	?	?	?	?	?	
Question Title	N	Mean	S D	Max Mark	F F	Attempt %	
1	4944	3.3	1.5	5	66	98.7	
2	4917	8.1	3.5	12	67.8	98.1	\leftarrow
3	4829	3	2.2	6	49.3	96.4	
4	4914	6.3	3	10	63.2	98.1	
5	4703	3.3	2.3	8	41.3	93.8	\leftarrow
6	4862	9	3.5	12	75.3	97	
7	4707	2.8	1.8	6	46.7	93.9	\leftarrow
8	4728	6.3	3.3	10	62.7	94.3	
9	4383	2	2	6	32.7	87.5	



2. (c) Find all values of ϕ in the range $0^{\circ} \leqslant \phi \leqslant 360^{\circ}$ satisfying

$$\frac{7}{\cos\phi} - \frac{10}{\sin\phi} = 0. ag{3}$$

Q2(c) 0 -> 360.	tano = sind
	cosq
7 - 10 =0	
cost Sind	tancos &= Sino
$7 - 10 = sin\phi$	
COSP	1
M-Not- (transcosses for so	A 2
- July Mary	
$7-10 = Sino \times cosco$	
3 = Sinacosp	
	-

Q2(c)	0 -> 360 .		tand = sind
			cos4
	7 - 10 =0		
	cos \$ Sin \$		tancos \$= 5in\$
		\bigcirc	· , ,
	$7 - 10 = sin\phi$		
	COSP		1
	Mrot thank costs	ØIØ	F
		,	
	$7-10 = Sind \times cosd$		
	3 = Sindcosp		

2. (c	$\frac{7}{\cos \phi} = \frac{10}{\sin \phi} = 0$
	$\frac{7}{\cos \phi} = \frac{10}{\sin \phi}$
	$\frac{7\sin\phi}{\cos\phi} = 10$
	$7 \tan \phi = 10$
	$70 = \tan^{-1}(10)$ $70 = 84.290^{\circ}, 264.29$
	0 = 12.04° / 37.76°
	: values of \$ = 12.04°, 37.76°

2. (c)	$\frac{7}{\cos \phi} - \frac{10}{\sin \phi} = 0$	
	7 _ 10_	
	cosp sinb	
	$\frac{7\sin\phi}{\cos\phi} = 10$	
	$7 \tan \phi = 10 \bigcirc$	
	$70 = \tan^{-1}(10)$ $70 = 84.290^{\circ}, 264.29$	
	Ø = 12.04° / 37.76°	
	values of \$ = 12.04°, 37.76°	

A0 A0

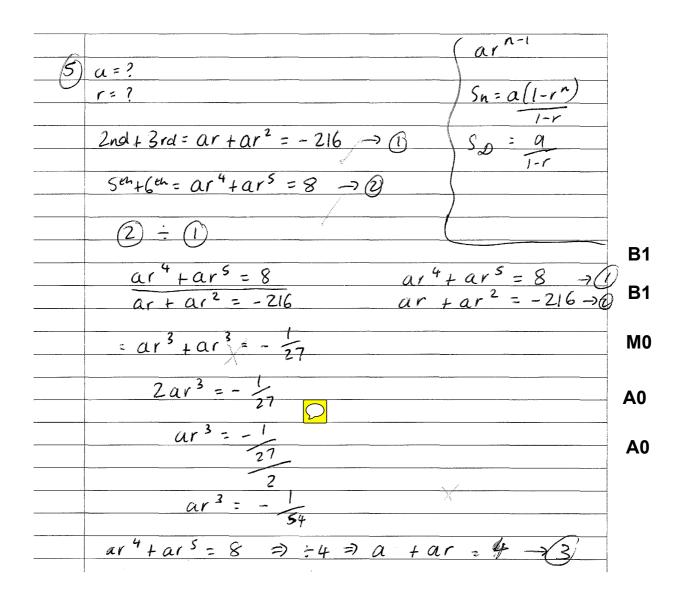
2. () -	7 - 10	= 0	0° < \$ < 360°
CC	sp Sinp	w	·
1 1	$-10 = \cos \phi$ $-3 = \sin \phi$	+ sn 0	
	$-\cos\phi = \sin\phi$	***************************************	
	-3 = sinp		
	cosp		
	= -71 · 57	(2·11·d)	

2. c) 7 - 10 = 0 0° \(\phi \) \(\phi \) \(\frac{360}{} \)	
COS \$ SIN\$	_ 0
$7 - 10 = \cos \phi + \sin \phi$ $-3 = \sin \phi \qquad \times \Omega$	
$-3 = \sin \phi \qquad \text{S}$ $-3 - \cos \phi = \sin \phi$	
$-3 = 5in\phi$	
Co S ∳	
$= -71 \cdot 57^{\circ} (2 \cdot 11 \cdot d)$	

5. A geometric series has first term a and common ratio r. The sum of the second and third terms of the series is -216. The sum of the fifth and sixth terms of the series is 8.

(a) Prove that
$$r = -\frac{1}{3}$$
. [5]

(ar^{n-1})	
$r=?$ $\int S_n = a(1-r^n)$	
$2nd + 3rd = ar + ar^2 = -216 \rightarrow 0$ $S_D = a$ $1-r$	
5en+6en= ar4+ar5 = 8 -> 0	
2 ÷ 1)	
$ar^{4} + ar^{5} = 8$ $ar^{4} + ar^{5} = 8 \rightarrow 0$ $ar + ar^{2} = -216$ $ar + ar^{2} = -216 \rightarrow 0$	0
$= ar^3 + ar^3 = -\frac{1}{27}$	
$2\alpha r^3 = -\frac{1}{27}$	
$ar^3 = -\frac{1}{27}$	
$ar^{2} = -\frac{1}{54}$	
ar4+ar5=8 => :4 => a + ar = 4 -3	



50.	Uguth		
	$U_2 + U_3 = -216$	U5 + U6 = 8	
	ar + ar2 = -216	ar4 + ar5 = 8	
	3		
	ar + ar = 8	a(r+r2) = -216	
	artar -216	a (r++r5) = 8	
		· ·	
	$\frac{\mathcal{X}(\Gamma^4 + \Gamma^5) = 8}{\mathcal{X}(\Gamma + \Gamma^2) = 216}$	r9 = 8	
	& (r+r2) -216	r3 -216	
	$r^3 = 8$ -216	63 = 8 = 1 $-216 = 27$	
	-216	-216 27	
		processes.	
	$-\Gamma = 8$	-38 	
	3/216	V216	
	f = 1	- r = 3	
	3	~	
	r=-1 3		
	3		

50.) Uzuta	
$U_2 + U_3 = -216$ $U_5 + U_6 = 8$	
$ar + ar^2 = -216$ $ar^4 + ar^5 = 8$	
3	
$\frac{ar^{3}+ar^{5}+8}{ar^{2}-216} = -216$	
-216 a (r++13) = 8	
x(r4+r5)-8	
$\frac{\mathcal{X}(\Gamma^4 + \Gamma^5) = 8}{\mathcal{X}(\Gamma + \Gamma^2) - 216} \qquad \frac{\Gamma^9 = 8}{\Gamma^3 - 216} $	
210	B1
r3 = 8 × r3 = 8 - 1	
$r^3 = 8$ -216 x $y = 8$	B1
process.	
$-\Gamma = \frac{8}{3\sqrt{216}}$	МО
3/216	IVIO
	Α0
$-\Gamma = \frac{1}{3}$	
3	Α0
	Au
r=-1 3	

$5)a) ar + ar^2 = -216 $ $ar^4 + ar^5 = 8$	
$ q(r+r^2) = -216$ $ q(r^4+r^5) = 8$	
q = -216 $q = 8$	
(r+r2) 0 r4+r5 2	
$ \begin{array}{ccc} $	
-216 = 8	
$(r+r^2)$ $r+r^5$	
$\frac{xr - 216}{r} = \frac{8}{(r^3 + r^4)}$	
r (r^3+r^4)	
-216(r3+r4)= 8r	
$-216(r^{2}+r^{3}+)=8$	
T P	
$-216(r^2+r^3)=8$	4
$-\frac{216r^2-216r^3-8}{r^2+(3-8)^2-216}$	
$-216r - \sqrt{116r^3} - \sqrt{8}$ $r^2(1+r) = -1/27$	_ L
$-\frac{216r-216}{2}$ $\frac{3}{8}$ $\frac{1}{2}$ $\frac{7}{2}$ $\frac{1}{2}$ $\frac{7}{2}$ $\frac{1}{2}$ $\frac{7}{2}$ $\frac{1}{2}$ $\frac{1}{2$	
$mazua$ $\sqrt{3} = -r(1+r)$	_
$\frac{-216(r+1)-2}{2}$	-
$\frac{-r+1=2/216}{\sqrt{3}}$ $\sqrt{3}$ $z-r-r^2$	-
$r+1=-1/108$ 9 $-r=$ $\sqrt{3}$ = -2r	\dashv
W3 2-2r	-
79	-
$\frac{1}{3}$	-
r = 1/3 QED	-
1-13 40	4

$5)a) ar + ar^2 = -216 @ ar^4 + ar^5 = 8$	SI
$a(r+r^2) = -216$ $a(r+r^2) = 8$	'
$q = \frac{-216}{(r+r^2)} 0 \qquad q = \frac{8}{r^4 + r^5} 2$	BI
$\overline{(r+r^2)}$ 0 $\overline{r^4+r^5}$ 2	
$(\mathcal{C} = \mathcal{C})$	
-216= 8	
$(r+r^2)$ r^4+r^5	
xr - 216 = 8	
$r(r^3+r^4)$	
$ -216/r^3+r^4 -8r$	
$-216(r^{2}+r^{3}+r^{3})=8$	_ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
7	$\prod M0$
$\frac{1}{2} - \frac{216(r^2 + r^3) - 8}{2}$	
$-\frac{216r^2-216r^3}{8} = 8 \qquad r^2+r^3=8/-216$	
$-216r - \sqrt{16r^3 - 38} \qquad r^2(1+r) = -1/27$ $-216r - 216 = 38 \qquad 1/27 = -r^2(1+r)$	_ 40
	_
$MAZVB \sim \sqrt{3} = -r(1+r)$	_
$\frac{-216(r+1)-2}{2}$	4
$\frac{-r+1=\frac{2}{216}}{\sqrt{3}}=-r-r^2$	_
r+1=-1/108 q	_
$-r = \sqrt{3} = -2r \times$	
Jq.	- 40
$\frac{1}{2} = -r$	_
3	-
$r = \frac{1}{3} QED$	

7. (a) Solve the equation

$$3^{\frac{5x}{4}-2} = 7.$$

Show your working and give your answer correct to three decimal places.

[3]

$7a) 3^{4x} = 7$	
$3^{44x} = 7x3^{4}$ $3^{44x} = 63$	
$\frac{3}{109363 = \frac{5}{4}}$	
$3C = (\log_3 63) = 3.017 (300)$	
74	

$\frac{3}{3^2} = 7$	
$\frac{3^2}{3^2}$	
34x = 7x32	
3 = 63 / D	_
109363=5xc	_
US 4	
$C = (\log_3 63) = 3.017 (300)$	-
\	
	-

(7a) Solve equation
3 = 7
logs both sides
log3 = -2 = log7
$\left(\frac{5x}{4}-2\right)\log 3 = \log 7$
$\left(\frac{5\pi}{4} - 2\right) = \frac{1097}{1093}$
) (0)3
5x - 1097 . 2
$\frac{5x = \frac{1097}{4} + 2}{\frac{1093}{1093}}$
4 (69)
Ex- 1007 2 (4)
51c = log7 +2 (4)
log3
$\kappa = \frac{\log 7}{12(4)}$
1093
5
x = 1.45424875
N=1.954 (3dr)
1 - 1 - 1 - 7 (3013)

(Ta) Solve equation	
3===7	
logs both sides	
log3 = = log7	
$(5x-2)\log 3 = \log 7$	
$\frac{(5\pi)}{(4-2)} = \frac{1097}{\log 3}$	
5x - 1007 . 2	M1
$\frac{5x = \frac{1097}{4} + 2}{\frac{1093}{1093}}$	
51 = log7 + 2 (4) D	A1
log3	
v = 1007 0(1)	
$\kappa = \frac{\log 7}{\log 3} + 2(4)$	A0
5	
x = 1.95424875 x = 1.954 (3dp)	

1)
(a)
$\frac{a_{1}}{3^{4}} = 7$
3
(32-2) 10ga3 = 10ga # 7
(5x-2) = 10ge 7
$\left(\frac{5x-2}{4}\right) = \frac{\log_4 7}{\log_4 3}$
1092 3
(52-2) = 1.771 (3dp)
(5x-2) = 1.77(18dp)
5x-2= 7.084
5x = 9.084
$\chi = 9.0687$
5
x= 1.817 (3dp)

Leave blank 7) M (32-2) 10ga 3 = 10ga # 7 5x-2)=1.77(3dp)5x-2= 7.084 5x = 9.084 x= 1.817 (3dp)