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Mark Scheme (Results)
Summer 2007

GCE

O Level Mathematics B (7361_01)

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7361 Paper 1 Mark Scheme
Summer 2007

1.	0.98 - 1.2/1.45	o.e	M1		
	15p		A1	2	**2**
2.	3 & 1/4 or 3 & 0.25 OR 3 & 4^{-1}	OR 3 x 4	B1		
	12		B1	2	**2**
3.	$(1.5 \times 10^{8}) / (9.465 \times 10^{12})$	o.e. eg implied by 1.6×10^{-5}	M1		
	1.58×10^{-5}		A1	2	**2**
4.	360 / (180 - 156)	o.e	M1		
	15		A1	2	**2**
5.	x(x - y) + z(x - y) or x(x + z) - y(x + z) (no errors allowed)		M1		
	(x + z) (x - y)		A1	2	**2**
6.	7.5/60 x 100	o.e	M1		
	12.5% or $12\frac{1}{2}\%$		A1	2	**2**
7.	19 + 24 < 3x	(no errors)	M1		
	15	c.w.o	A1	2	**2**
8.	$\frac{50}{360} \times 2 \times \pi \times 12$	(seen or implied)			
OR					
	12×0.873 (in radians)		M1		
	10.5 cm		A1	2	**2**

9.	(i)	2	B1	1	
	(ii)	9	B1	1	
	(iii)	2, 9	B1 ft	1	**3**
		NB: For the ft, the elements must be elements of E . If 0 appears in (iii) then no ft, B0.			

10.	$\angle DAC = 50^o$		B1		
	$\angle ADC$ = 180 - 2 x "$\angle DAC$"	OR $\angle DCA =$ "$\angle DAC$"	M1		
	$\angle BDC = 15^o$		A1	3	**3**
	NB: Allow angles on diagram.				

11.	Points *A*, *C* and *D* correctly plotted and labelled		B1		
	Either point *B* (0, 2) or *E* (5, 3) correctly plotted and labelled		B1		
	Correctly drawn		B1	3	**3**

12.	8 (x - 8) = 5x20 (fractions cleared, one slip) o.e ie integer × x = ….		M1		
	Correct		A1		
	x = $20.5, 20\frac{1}{2}, \frac{41}{2}$		A1	3	**3**
	Special Case: $\frac{x}{20} = \frac{41}{40}$	OR $0.05x$ = 1.025	M1 A1		

13.	$\sqrt{24^2 + 7^2}$ (= 25)		M1		
	$\pi \times 7 \times$"25" OR 550 or better seen		M1 (DEP)		
	175π	c.w.o	A1	3	**3**
	NB: If the first line is missing and $\pi \times 7 \times$"25" seen, BOD.				

14.	Horiz. line through 6, length 5.5 secs		M1		
	A straight line which starts where the last line finished and terminates on the *seconds* axis 6 seconds further along		M1		
	Completely correct	(11.4 $\rightarrow$ 11.6 secs)	A1	3	**3**

15.	15 x 56	o.e.	M1		
	(“15x56” - 5x24) / 10	o.e	M1 (DEP)		
	72		A1	3	**3**

16.	(CPxDP = BPxAP)				
	$(\frac{3}{4}x + 12)\ 12 = (x + 10)\ 10$	o.e (no slips)	M1		
	$144 + 9x = 100 + 10x$	(expand out brackets, no slips)	M1 (DEP)	o.e	
	$x = 44$		A1		
	CD = 33 cm		A1ft	4	**4**

17.	$\frac{48}{2058}$ OR $\frac{2058}{48}$	o.e	B1		
	$\left(\frac{x}{21}\right)^3 = \frac{48}{2058}$		M1		
	$x = \sqrt[3]{216}$	o.e	B1		
	6 (ie answers rounding to 6.00, 3 sf)		A1	4	**4**
OR					
	Ratio of volumes = 8 : 343 (48 : 2058)		B1		
	Ratio of lengths = 2 : 7 (3.6341 : 12.6992)		B1		
	"$\frac{2}{7}$" x 21		M1		
	6		A1	4	**4**
18.	$\frac{11 \pm \sqrt{11^2 - 4 \times 5 \times (-2)}}{2 \times 5}$	completely correct, o.e	M1		
	$\sqrt{161}$ or 12.7 or better		B1		
	2.37, -0.17		A1, A1	4	**4**
19.	$w(x - y) = 2x - 3y$	(denominator removed, no slips or MR)	M1		
	$wx - 2x = wy - 3y$	(1 sign slip)	M1 (DEP)		
	$x(w - 2) = wy - 3y$	(no slips)	M1 (DEP) ft		
	$x = \frac{wy - 3y}{w - 2}$	o.e	A1	4	**4**

20.	(a)	$\frac{26}{48} \times 360$		M1		
		195^o		A1	2	
	(b)	(195^o, 105^o, 60^o)				
		One sector correct with the angle marked		M1		
		Completely correct, inc. angles and players		A1	2	**4**
21.	(a)	$\angle CDB$ = (106 - 42)^o (= 64)	o.e.	eg $\angle CBD$ = 116 - 90 M1		
		$BD = \frac{7}{\sin"64"}$	o.e.	M1 (DEP)		
		7.79 cm		A1	3	
	(b)	$BA = \frac{"7.79"}{\tan 48}$		M1		
		7.01 cm		A1	2	**5**
22.	(a)	line from (2, -2) and when extended would pass through the segment from (-1, 0) to (0, 1)		M1		
		line passing through the segment from (-1, 0) to (0, 1)and is drawn below the mid point of *AB*		A1	2	
	(b)	complete circle centre *C*,		M1		
		passing through 2 of (3, 3), (-1, -1), (-1, 7) and (-5, 3)		A1	2	
	(c)	74, 75, 76 mm		B1	1	**5**
23.	19.6 = k x 2^2	OR 19.6 k = 2^2	o.e	M1		
	k = 4.9	OR 0.204		A1		
	s(5) - s(4) eg "4.9"x 5^2 - "4.9"x 4^2			M1 (DEP)		
	122.5 OR 78.4	(rounding to)		B1		
	44.1 m (exactly)			A1	5	**5**

24. 36^o OR 54^o OR 72^o seen for relevant angle B1

height = 6 x tan "108/2" M1
8.26 (8.2583)

area of one triangle = $\frac{1}{2}\times"8.2583"\times 12$ M1 (DEP)

area of pentagon = 5 × "$\frac{1}{2}\times"8.2583"\times 12$" M1 (DEP)

OR

O centre of pentagon,
$DO = \frac{12\times\sin 54}{\sin 72}$ (= 10.208) o.e M1

$\Delta DOC = \frac{1}{2}\times 12\times"10.208"\times\sin 54$ o.e M1 (DEP)

area of pentagon = $5\times"\Delta DOC"$ M1 (DEP)

OR

Evaluating areas of ΔADE , ΔABC and ΔADC

AD = 19.4 or better OR $12\left(\frac{\sqrt{5}+1}{2}\right)$ B1

Area of ΔADE M1

Area of ΔADC M1

$2\times\Delta ADE + \Delta ADC$ M1 (DEP)

OR

area of triangle = $\frac{1}{2}\times 12^2\times\sin 108$ M1
68.5 (68.4761)

area of trapezium = $\frac{1}{2}\times"11.4127"\times(12+2\times"9.7082")$ (= 179.273)
M1

area of pentagon ="68.5" + $\frac{1}{2}\times"11.4127"\times(12+2\times"9.7082")$
M1 (DEP)

247, 248 cm^2 A1 5 **5**

	Special Case: Use of area of polygon = $\frac{nl^2}{4}\tan\frac{\theta}{2} = \frac{nl^2}{4\tan\frac{180}{n}}$ (n =5, l = 12)			
	θ = 108 or '180' in relevant formula	B1		
	fully correct substitution	M3		
25.	(a) (4 ⊗ 5 =) 24, 48	B1, B1	2	
	(b) x*4 = 4x - 4	M1		
	5 + 5 (4x - 4) = 75	M1 (DEP)		
OR				
	5 + 5y = 75 ($y = x$ * 4)	M1		
	4x - 4 = 14	M1 (DEP)		
	$4.5, \frac{9}{2}, 4\frac{1}{2}$	A1	3	**5**
26.	$5x^2$ +3x - 5x -3 = 4 (one sign slip)	M1		
	$5x^2$ - 2x - 7 = 0	A1		
	(5x - 7) (x + 1) (factorizing a trinomial quadratic)	M1		
	$\frac{7}{5}$ $\left(\text{or } 1\frac{2}{5}, 1.4\right)$, -1	A1, A1	5	**5**
27.	(a) Q = (-6, 6), plotting "Q"	B1, B1ft	2	
	(b) R = (-2, -4) thus attempt to premultiply the column vector for P by **M** (one correct value)	M1		
	correct plot of R and (-2, -4) seen	A1	2	
	(c) Using Pythogoras to find either QP or QR			
	(= $\sqrt{4^2+10^2} = \sqrt{116}$ or rounding to 10.7, 10.8)	M1		
	correctly showing QP = QR	A1	2	**6**

28.	(a) $3t^2 - 18t + 24$ (3 terms, 2 terms correct)	M1		
	All correct and identified eg "$v =$, $\frac{ds}{dt} =$"	A1	2	
	(b) $a = 6t - 18$ (2 terms, 1 term correct)	M1		
	All correct	A1		
	$t = 3$	A1		
	Substituting "$t = 3$" into c's expression for v	M1 (DEP)		
	-3 ISW	A1	5	**7**