

# Mark Scheme (Results) Summer 2008

GCE O Level

## O Level Mathematics B (7361) Paper 1

# Mathematics B 7361

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## Paper 1

**General:** Penalise not corrected answers where they are demanded by the question.

1.  $\frac{x(x+2) - 2 \cdot x}{2(x+2)}$  M1 (no slips)
- $\frac{x^2}{2(x+2)}$  A1 2
- Total 2 marks
2.  $10.5/24 \times 100$  (o.e. ,  $\frac{600+30}{1440} \times 100$ ) M1
- 43.75 or  $43\frac{3}{4}\%$  A1 2
- NB: 10.3 instead of 10.5 scores M0
- Total 2 marks
3.  $45/1.86$  M1
- £ 24.19 A1 2
- Total 2 marks
4. 9 or 4 OR  $(3+2)(3-2)$  M1
- 5 A1 2
- Total 2 marks
5.  $p = -3$  ,  $q = -6$  B1, B1 2
- Total 2 marks
6. 7, 16, 25  
any two correct (ignore any incorrect values) B1
- all three correct (no extra/incorrect values offered) B1 2
- Total 2 marks
7. (a) 0 B1
- (b) 2 B1 2
- Total 2 marks

8.  $\frac{9 - -(5)}{2 - 4}$  or  $\frac{-5 - 9}{4 - 2}$  M1

-7 A1 2

**NB:** If using  $y = mx + c$ , must solve for  $m$  completely, allow 1 slip for M1

**Total 2 marks**

9.  $\frac{1}{2} \cdot 3x \cdot 17 = 204$  or  $17x + \frac{1}{2} \cdot 17 \cdot x = 204$  M1

8 A1 2

**Total 2 marks**

10. (a)  $A \cap B \cap C$  B1 1
- (b)  $(A \cap C) \cup B$  or  $(A \cup B) \cap (C \cup A)$  B1 1
- (c)  $(A \cup B) \cap C$  or  $(A \cap C) \cup (B \cap C)$  B1 1  
or  $(A \cap B \cap C) \cup (A \cap C) \cup (B \cap C)$

**NB:** Brackets are required in (b) and (c)

**Total 3 marks**

11.  $\frac{4(5 - y) - 5}{2} < 7$  M1

$10 - 2y - 5 < 21$  (ie remove denominator) M1 dep

conclusion A1

**OR**

$x < 13/2$  (o.e.) or  $2x < 13$  M1

$y > 5 - 2 \times 13/2$  M1 dep

conclusion A1 3

**NB:** equality sign is not acceptable in the  $y > 5 - 2 \times 13/2$  line - this can score at best M1 M0 A0

**Total 3 marks**

12. (a)  $52^\circ$  B1 1  
 (b)  $\angle DCE = 180^\circ - 2 \times (16^\circ + c's(52^\circ))$  M1  
 $44^\circ$  A1 2

**NB:** Accept answers on diagram and apply ISW if the angle on the answer line is different from correct angles shown in the diagram

**Total 3 marks**

13. Curved surface area =  $8 \cdot 17 \pi$  M1  
 Total surface area =  $8 \cdot 17 \pi + 8 \times 8 \times \pi$  M1 dep  
 conclusion A1 3

**NB:** (1)  $\pi \times 8 \times (8 + 17)$  scores M1 M1 then conclusion, A1  
 (2) Use of decimal or fractions for  $\pi$  scores M1 M1 but A0 at best

**Total 3 marks**

14. (a) 9 B1 1  
 (b) 5 B1 1  
 (c) 7 B1 1

**Total 3 marks**

15. (a)  $\frac{1}{4}$  B1 1  
 (b)  $y(4x - 1) = 1$  or  $x(4y - 1) = 1$  or  $\frac{1}{y} = 4x - 1$  M1  
 or  $\frac{1}{x} = 4y - 1$

$(1 + x)/4x$  or  $\frac{x^{-1} + 1}{4}$  or  $\frac{1}{4} + \frac{1}{4x}$  or A1 2  
 $\frac{1}{4} \left( 1 + \frac{1}{x} \right)$

**Total 3 marks**

16. (a)  $5^2 \times 12$  M1  
 $300 \text{ cm}^2$  A1 2
- (b)  $6/5^3$  M1  
 $0.048 \text{ litres or } \frac{6}{125} \text{ litres}$  A1 2

**NB: If any numbers are seen in part (b) which may have come from part (a), send the item to Review**

**Total 4 marks**

17. (a)  $(3x + 7)(x + 3)$  M1, A1 2
- (b) 67, 23 or  $67 \times 23$  B1(one correct), B1 (both correct) 2

**NB: (1) Deduct 1 mark if more than 2 primes eg 1, 67, 23 scores B1 B0**

**(2)  $67 \times a$  (where  $a \neq 23$ ) or  $b \times 23$  (where  $b \neq 67$ ) scores B1 B0**

**Total 4 marks**

18. 78 kg or  $3 \times 26$  B1  
 $114 + c's(78)$  M1  
 $c's(192) / 24 = x$  M1 dep
- OR**  
(here x is the original number of sheep) M1  
 $114 + c's(78)$  M1 dep  
 $c's(x=5)+3$  M1 dep
- 8 sheep A1 4

**NB:  $c's(78)$  cannot be 26**

**Total 4 marks**

19.  $120 = k \cdot 5^2$  (o.e) M1  
 $k = 4.8$  A1  
 $s = c's(k) \times 3^2$  M1 dep
- $43.2 \text{ m or } 43\frac{1}{5} \text{ m}$  A1 4

**Total 4 marks**

20.	(a)	Complete method for finding internal angle of a pentagon	M1	
		108°	A1	2
	(b)	complete (and correct) method for finding either $\angle BAC$ and $\angle EAD$ or $\angle ACD$ and $\angle ADC$ or $\angle ADE$	M1	
		$\angle BAC = 36^\circ$ and $\angle EAD = 36^\circ$ or $\angle ACD = \angle ADC = 72^\circ$ or $\angle ADE = 36^\circ$	A1	3
		$\angle DAC = 36^\circ$	A1	
		<b>NB:</b> Accept answers on diagram and apply ISW if the angle on the answer line is different from correct angles shown in the diagram		
				<b>Total 5 marks</b>
21.		$a^2 = (b + c)/(b - c)$	M1	
		$a^2(b - c) = b + c$	M1 dep	
		$a^2b - b = c + a^2c$ (allow sign slip)	M1 dep	
		$a^2b - b = c(1 + a^2)$	M1 dep	
		$c = (a^2b - b)/(1 + a^2)$ (o.e)	A1	5
				<b>Total 5 marks</b>
22.	(a)	Plotting both A and C	B1	
		Either B or D correctly plotted	B1	
		All vertices correct and square drawn.	B1	3
	(b)	Correct use of Pythagoras (or recognising 3, 4, 5 $\Delta$ )	M1	
		5	A1	2
				<b>Total 5 marks</b>

23. (a)	£ 6320	B1	1
(b)	$c's(a) - (15 \times 280 \times 110/100 + 360 \times 125/100)$	M1	
	£ 1250	A1	2
<b>NB:</b> No MR for 10% or 25%			
(c)	$c's(1250)/c's(6320) \times 100$	M1	
	19.8 %	A1	2
<b>Total 5 marks</b>			

24.	$2 - x(x - 1) = -4$ (no sign slips)	M1	
	$x^2 - x - 6 = 0$	A1	
	$(x - 3)(x + 2) = 0$ (solving a trinomial quadratic - usual rules)	M1 Indep	
<b>OR</b>			
	$2 - bc = -4$	M1	
	$bc = 6$	A1	
	$x(x-1)= 6$ (solving a trinomial quadratic - usual rules)	M1 indep	
	3, -2	A1, A1	
<b>NB:</b> If using a T&E method, they must have both correct answers otherwise the candidate collects no marks ie from working he may collect the first M1 A1 but unless he has <i>both</i> 3 <i>and</i> -2 he will <b>not</b> collect the M1 A1 A1			5
<b>Total 5 marks</b>			

25. (a)	correctly drawn	B1	1
(b)	correctly drawn	B1	1
<b>NB</b> In (a) and (b), allow a tolerance of 2mm for the length of the lines and angles ie the thickness of the lines on the overlays		B1	1
(c)	73 km ( $\pm 2$ km)	B1	
(d)	Attempting to measure a bearing from A which is greater than $180^\circ$	B1	2
	accept answer in the range $198 - 201^\circ$ (integer values only)		
<b>Total 5 marks</b>			

26. (a)	$15/100 \times 360;$ $54^\circ$	M1, A1	2
(b)	One correct sector, angle clearly marked	B1	
	Two sectors, angles clearly marked	B1	
	All correct, angles clearly marked	B1	3
		<b>Total 5 marks</b>	
27. (a)	$68^\circ$	B1	1
(b)	$\angle PAO = 360 - [c's(68) + 90 + 34]$	M1	
	$= 168^\circ$	A1	
	$\angle BAO = 12^\circ$	A1	
	<b>OR</b>		
	$\triangle OBC$ is isosceles $\triangle$ so		
	$\angle OBC = \angle OCB = \angle PCB (= 112^\circ) - 90$	M1	
	$= 22^\circ$	A1	
	$\angle BAO = 12^\circ$	A1	3
	<b>NB:</b> Accept answers on diagram and apply ISW if the angle on the answer line is different from correct angles shown in the diagram		
(c)	$\angle OBC = 34 - c's(12)$ or	M1	
	$\angle BCO = 180 - (90 + 2 \times 34)$		
	<b>ie</b> complete method needed		
	$22^\circ$	A1	2
	<b>NB:</b> Accept answers on diagram and apply ISW if the angle on the answer line is different from correct angles shown in the diagram		
		<b>Total 6 marks</b>	



28. (a)  $2 \times 15 \times \cos 40^\circ$  (o.e) M1  
 $100/360 \times 2 \times \pi \times 15$  M1  
 $2 \times 15 \times \cos 40^\circ + 100/360 \times 2 \times \pi \times 15$  M1 dep  
49.2 cm A1 4
- (b)  $100/360 \times \pi \times 15^2$ ,  $\frac{1}{2} 15^2 \sin 100^\circ$  (one of) M1  
 $100/360 \times \pi \times 15^2 - \frac{1}{2} 15^2 \sin 100^\circ$  M1 dep  
85.5, 85.6 cm<sup>2</sup> A1 3

Total 7 marks

**TOTAL 100 MARKS**