

Mark Scheme (Results) January 2010

GCE O Level

Mathematics Syllabus B (7361/01) Paper 1

Edexcel is one of the leading examining and awarding bodies in the UK and throughout the world. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers.

Through a network of UK and overseas offices, Edexcel's centres receive the support they need to help them deliver their education and training programmes to learners.

For further information please call our Customer Services on + 44 1204 770 696, or visit our website at www.edexcel.com.

If you have any subject specific questions about the content of this Mark Scheme that require the help of a subject specialist, you may find our **Ask The Expert** email service helpful.

Ask The Expert can be accessed online at the following link:

<http://www.edexcel.com/Aboutus/contact-us/>

January 2010

All the material in this publication is copyright
© Edexcel Ltd 2010

Mathematics B 7361

Paper 1

1.	$3(-4)^2 + \frac{4}{5} + 5^2$	M1	
	73.8 or $73\frac{4}{5}$ or $\frac{369}{5}$	A1	2
<hr/>			
2.	{-1, 0, 3, 8}	B2 (-1eeoo)	2
<hr/>			
3.	$ A = 2 \times 4 - 3x = 17$	M1	
	$x = -3$	A1	2
<hr/>			
4.	3 as a numerator or 51, 57, 63 identified	B1	
	$\frac{3}{10}$	B1	2
<hr/>			
5.	1000 00: 800 00: 50 (conv. to cm) OR 1000 : 800 : 0.5 (conv. to m)	M1	
	2000: 1600: 1	A1	2
<hr/>			
6.	$\sqrt{(-8)^2 + 6^2}$	M1	
	10	A1	2
<hr/>			
7.	$x+4 + x-2 = x-2 + 2x-1$ (o.e.)	M1	
	$x = 5$	A1	2
<hr/>			
8.	0.05×10^{-4}		
	OR		
	0.0002 and 0.000005	B1	
	2.05×10^{-4}	B1	2
	SC: any correct equivalent form involving a power of 10 earns B1, B0		

9. (a)	2	B1	1	
(b)	2	B1	1	2
<hr/>				
10. (a)	$\begin{pmatrix} 4 & -6 \\ -4 & -2 \end{pmatrix}$	B1	1	
(b)	$\begin{pmatrix} -23 & 18 \\ -26 & 17 \end{pmatrix}$	B2 (-1eeoo)	2	3
<hr/>				
11.	either $\frac{3}{5} \times \frac{2}{5}$ or $\frac{2}{5} \times \frac{3}{5}$	M1		
	$\frac{3}{5} \times \frac{2}{5} + \frac{2}{5} \times \frac{3}{5}$	M1 (dep)		
	$\frac{12}{25}$ (o.e.)	A1		3
	OR			
	$\frac{3}{5} \times \frac{3}{5} + \frac{2}{5} \times \frac{2}{5}$	M1		
	1- $(\frac{3}{5} \times \frac{3}{5} + \frac{2}{5} \times \frac{2}{5})$	M1 (dep)		
	$\frac{12}{25}$ (o.e.)	A1		
<hr/>				
12. (a)	3, 8	B1	1	
(b)	4, 7, 9	B1	1	
(c)	1, 5, 6	B1	1	3
<hr/>				
13.	$\frac{1}{8}$ OR 4 OR 0.125	B1		
	$\frac{\frac{1}{8} + 8}{4}$ (o.e.)	B1		
	$\frac{65}{32}$ (o.e.)	B1		3
<hr/>				

14. (a)	$\begin{pmatrix} 0 \\ 4 \end{pmatrix}$ seen	B1		
	(5, 3)	B1	2	
	(b) $x = 5$	B1	1	3

15.	$5x + x < 32 - 6$ (o.e.)	M1		
	(allow one sign slip)			
	$x < \frac{26}{6}$ (o.e.)	A1		
	4	A1		3

16.	$\sqrt{8}$ OR 19.5° or better	B1		
	$\left(\frac{1}{\sqrt{8}}\right)^2 + \left(\frac{\sqrt{8}}{3}\right)^2$			
	OR $(\tan 19.5)^\circ + (\cos 19.5)^\circ$	M1		
	$\frac{73}{72}$ (c.a.o.)	A1		3

SC: Candidate who uses 2.8 earns, at most, B0, M1, A0

17.	8 for the diameter seen and used	B1		
	$x^2 + x^2 = \text{“diameter”}^2$	M1		
	5.66 cm	A1		3
	OR			
	4 for the radius seen and used	B1		
	“radius” ² + “radius” ² = x^2	M1		
	5.66 cm	A1		

18.	$3m + n - 3(m - n)$ (accept a multiple of this expression)	M1		
	$\frac{3m + n - 3m + 3n}{12}$ (1 sign slip) (o.e.)	M1 (dep)		
	$\frac{n}{3}$	A1		3
<hr/>				
19.	$0.9 \times a$ OR $1.2 \times b$	M1		
	$\frac{0.9 \times a}{1.2 \times b}$	M1		
	$0.75 \frac{a}{b}$ (o.e.)	M1		
	25%	A1		4
<hr/>				
20.	$V = kd^3$	M1		
	$k = \frac{V}{d^3}$	M1 (dep)		
	$3V = \frac{V}{d^3} D^3$	M1 (dep)		
	$D = d \times \sqrt[3]{3}$ or $d \times 1.44$ (o.e.)	A1		4
<hr/>				
21. (a)	4	B1	1	
(b)	$\frac{(3 \times 0) + (4 \times 1) + \dots}{3 + 4 + 6 + 7 + 9 + 11}$	M1		
	(one error allowed in numerator)			
	completely correct terms, not necessarily collected (129/40)	A1		
	3.23 (or better)	A1	3	4
<hr/>				

22.	$\angle AFE = 120^\circ$ or $\angle XFY = 60^\circ$	B1		
	One written reason to support either	B1		
	$\angle AFE = 120^\circ$ or $\angle XFY = 60^\circ$			
	i.e.			
	$\angle AFE = 120^\circ$ (angle of a hexagon)			
	OR			
	$\angle XFY$ or $\angle AFX = 60^\circ$ (equilateral triangle)			
	One written reason to support either $\angle EFY$	B1		
	or $\angle EYF$			
	i.e.			
	$\angle EFY = 120^\circ$ (angles at a point) (o.e.)			
	OR			
	$\angle EYF = 30^\circ$ (isosceles triangle)			
	$\angle EYF = 30^\circ$	B1		4
<hr/>				
23. (a)	$\frac{85}{100} \times \pounds 150000$	M1		
	$\pounds 127\,500$	A1	2	
(b)	$\left(\frac{127500}{2.5} - 30000 \right)$ (o.e.)	M1		
	$\pounds 21\,000$	A1	2	4
<hr/>				
24. (a)	perpendicular bisector of A and B	M1		
	line drawn accurately	A1	2	
(b)	Point C plotted and labelled	B1	1	
(c)	arc of circle, centre B , radius 3cm	B1		
	region shaded correctly	B1 ft	2	5
<hr/>				

25. (a) line drawn	B1	1	
(b) line drawn	B1 ft	1	
(c) $\frac{84}{54}$	M1		
1.6 hrs	A1	2	
(d) line drawn	B1 ft	1	5

26. (a) $BF = \frac{4}{\tan 30}$	M1		
6.93	A1	2	
(b) $BC = "6.93"+5$	M1		
$AC = \frac{5}{\tan 20} + 4$	M1		
$AB = \sqrt{"AC"{}^2 + "BC"{}^2}$	M1 (dep)		
<i>(M1 dependent on only one of the previous method marks)</i>			
21.4 (cao)	A1	4	6

OR

$$BE = \sqrt{4^2 + "6.93"{}^2} \text{ or } AE = \sqrt{5^2 + "13.7"{}^2} \quad \text{M1}$$

$$\text{or } BE = \frac{4}{\sin 30^\circ} \quad \text{or } AE = \frac{5}{\sin 20^\circ}$$

$$BE = \sqrt{4^2 + "6.93"{}^2} \text{ and } AE = \sqrt{5^2 + "13.7"{}^2} \quad \text{M1}$$

and $\angle BEA = 140^\circ$

correctly substituted cosine formula for AB^2 M1 (dep)

(M1 dependent on only one of the previous method marks)

21.4 (cao) A1

27. (a) $\frac{480}{120} \times 100^\circ$	M1			
£400	A1	2		
(b) " $\frac{480}{120}$ " $\times 140^\circ$	M1			
£560	A1	2		
(c) 1 sector with label and correct angle marked	M1			
All correct	A1	2		6
SC: No labeling but angles correct \Rightarrow M1, A0				

28. (a) $(2 \otimes 1) = 3$	B1			
-2	B1	2		
(b) $\frac{x}{5} - 5$	M1			
$\frac{6 + \frac{x}{5} - 5}{\frac{x}{5} - 5} = -4$	M1			
$6 + \frac{x}{5} - 5 = -\frac{4x}{5} + 20$ (o.e)	M1			
$x = 19$	A1	4		6
OR				
$\frac{6+y}{y} = -4$	M1			
$x * 5 = -\frac{6}{5}$	M1			
$\frac{x}{5} - 5 = -\frac{6}{5}$	M1			
$x = 19$				

29. (a) Remaining volume = $\frac{1}{3}\pi(10^2 \times 10 - 1^2 \times 1)$

1046

M1

A1

2

(b) (dividing by 3)

volume emptied/minute $\left(\frac{"1046"}{3}\right)$

M1

(dividing by 60)

volume emptied/sec $\left(\frac{"1046"}{180}\right)$

M1

seeing $\pi \times 1^2$ (o.e.)

M1

(dividing by $\pi \times 1^2$)

speed = $\frac{"1046"}{180\pi}$

M1

1.85

c.a.o

A1

5

7

(TOTAL 100 MARKS)

Further copies of this publication are available from
International Regional Offices at www.edexcel.com/international

For more information on Edexcel qualifications, please visit www.edexcel.com
Alternatively, you can contact Customer Services at www.edexcel.com/ask or on + 44 1204 770 696

Edexcel Limited. Registered in England and Wales no.4496750
Registered Office: One90 High Holborn, London, WC1V 7BH