edexcel

Mark Scheme (Results)

Summer 2015

Pearson Edexcel International GCSE
Mathematics B (4MB0)
Paper 01

PEARSON

Edexcel and BTEC Qualifications

Edexcel and BTEC qualifications are awarded by Pearson, the UK's largest awarding body. We provide a wide range of qualifications including academic, vocational, occupational and specific programmes for employers. For further information visit our qualifications websites at www.edexcel.com or www.btec.co.uk. Alternatively, you can get in touch with us using the details on our contact us page at www.edexcel.com/contactus.

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.
  Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- **Types of mark**
  - o M marks: method marks
  - o A marks: accuracy marks
  - o B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
  - o cao – correct answer only
  - o ft – follow through
  - o isw – ignore subsequent working
  - o SC - special case
  - o oe – or equivalent (and appropriate)
  - o dep – dependent
  - o indep – independent
  - o eeoo – each error or omission
  - o awrt –answer which rounds to

- **No working**

  If no working is shown then correct answers normally score full marks

  If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **With working**

  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

  If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

  Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

  If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

  If there is no answer on the answer line then check the working for an obvious answer.

- **Ignoring subsequent work**

  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Parts of questions**

  Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

Question	Working	Answer	Mark	Notes
1	$\dfrac{8}{5} \times 155$		2	M1
		248 (cars)		A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
2		$x = 3$	2	B1
		$y = -2$		B1
				Total 2 marks

Question	Working	Answer	Mark	Notes
3	$\tan e^o = \dfrac{9-5}{20}$		2	M1
		$e^{\,o} = 11.3^{o}$		A1 isw if possible (eg if angle of elevation has been identified)
				Total 2 marks

Question	Working	Answer	Mark	Notes
4	Three terms having common difference of 3		2	M1
		−1, 2, 5		A1 No working scores M0A0
				Total 2 marks

Question	Working	Answer	Mark	Notes
5	3×5 and 7×1 seen		2	M1
		8		A1 cao
				Total 1 marks

Question	Working	Answer	Mark	Notes
6		(-2, -9)	2	B2 (-1eeoo)
				SC: B1 B0 for $\begin{pmatrix} -2 \\ -9 \end{pmatrix}$
				Total 2 marks

Question	Working	Answer	Mark	Notes
7	$n \le -\dfrac{23}{9}$		2	M1 oe
		n = -3		A1
	OR (Trial and inspection)			
	Noting that 9 x (-2) + 50 = 30 (>27 − (oe)) AND 9 x (-3) + 50 = 23 (<27 − (oe))			M1
		n = -3		A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
8	$42 = 2 \times 3 \times 7$ $84 = 2 \times 2 \times 3 \times 7$ $154 = 2 \times 7 \times 11$ Prime factors of two of 42, 84 and 154		2	M1
	OR			**OR**
	Any two of: $42 = 3 \times 14$ $84 = 6 \times 14$ $154 = 11 \times 14$			M1
	OR			**OR**
	Attempt at factor tree for two of the numbers involving at least 2 divisions			M1
		HCF = 14		A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
9	$81 = 3^4$		3	M1
	$\therefore 4 = 3x - 11$			M1 dep, equating indices
		$x = 5$		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
10	$\dfrac{1+2a}{a-1}=5$		3	M1 oe, allow 1 sign error
	$1+2a=5(a-1)$			M1 oe, dep
		$a=2$		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
11	People over 60 = $\dfrac{23}{100}\times 50$ (000 000)		3	M1
	Women over 60 = $\dfrac{58}{100}\times"\dfrac{23}{100}\times 50$ (000 000)"			M1 dep
		7 million		A1 cao
				Total 3 marks

Question	Working	Answer	Mark	Notes
12	$y + b = \dfrac{a}{x^2}$ OR $yx^2 + bx^2 = a$			M1
	$x^2 = \dfrac{a}{y+b}$		3	M1 dep
	$x = \sqrt{\dfrac{a}{y+b}}$			A1
				SC: $x = \sqrt{\dfrac{a}{y-b}}$ scores M1 M0 A0
				Total 3 marks

Q	Working	Answer	Mark	Notes
13 (a)			2	B2 (-1eeoo)
(b)		20	1	B1
				Total 3 marks

Question	Working	Answer	Mark	Notes
14 (a)		0.24	1	B1 Allow 6/25, 24%
(b)	"0.24" × 600			M1
		144	2	A1 ft
				Total 3 marks

www.dynamicpapers.com

Question	Working	Answer	Mark	Notes
15 (a)		81	1	B1
(b)	$1.2...\times10^{n}$		2	M1
		$1.23...\times10^{-2}$		A1 awrt
				Total 3 marks

Question	Working	Answer	Mark	Notes
16 (a)		e	1	B1
(b)		i, j	1	B1
(c)		b, c, d	1	B1
				Total 3 marks

Question	Working	Answer	Mark	Notes
17	$\dfrac{18\sqrt{36}}{3\sqrt{24}}-\dfrac{6\sqrt{12}}{3\sqrt{24}}$		3	M1
	$6\sqrt{\left(\dfrac{36}{24}\right)}-2\sqrt{\left(\dfrac{12}{24}\right)}$			M1 independent
	OR			**OR**
	$\dfrac{36}{\sqrt{24}}-\dfrac{6\sqrt{12}}{3\sqrt{24}}$			M1
	$\dfrac{3\times6}{\sqrt{6}}-2\sqrt{\left(\dfrac{12}{24}\right)}$			M1 dep
		$\sqrt{54}-\sqrt{2}$		A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
18	$AC^2 = 8^2 + 10^2$			M1
	$r = \dfrac{\sqrt{(8^2 + 10^2)}}{2}$			M1 oe
	Area $= \pi \times \left("\dfrac{\sqrt{(8^2 + 10^2)}}{2}" \right)^2$		4	M1 dep
		129 cm^2		A1 awrt
				Total 4 marks

Question	Working	Answer	Mark	Notes
19	Rearranging so that the coefficient of x or y is the same in both equations **OR** isolating x or y			M1
	Subtracting or adding equations **OR** substitution of x or y to obtain an expression for y or x		4	M1
		$x = \dfrac{13}{10}$, 1.3		A1
		$y = \dfrac{29}{10}$, 2.9		A1
				Total 4 marks

www.dynamicpapers.com

Question	Working	Answer	Mark	Notes
20 (a)	$\frac{1}{2}\times 50\times 3$		2	M1 oe
		75 km		A1
(b)		25 km/h	1	B1
(c)		1.5 hours	1	B1 Allow $\pm$ 1ss = 0.05 hours
				Total 4 marks

Question	Working	Answer	Mark	Notes
21 (a)		smallest = 0.5	2	B1
		largest = 4		B1
(b)	$\frac{(-2)^0+\frac{63}{105}+4+0.5}{4}$		2	M1 oe
		1.525		A1 cao
				Total 4 marks

Question	Working	Answer	Mark	Notes
22 (a)		$\frac{7}{20}$	1	B1 oe
(b)	2 of $\frac{7}{20}\times\frac{3}{19}$, $\frac{3}{20}\times\frac{7}{19}$ and $\frac{10}{20}\times\frac{9}{19}$		3	M1 oe
	$\frac{7}{20}\times\frac{3}{19}+\frac{3}{20}\times\frac{7}{19}+\frac{10}{20}\times\frac{9}{19}$			M1 dep, oe
		$\frac{132}{380}$ (oe), 0.347		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
23	$4x - 6x = 4$			M1 oe
	$16y + 3y = 19$			M1 oe
		$x = -2$	4	A1
		$y = 1$		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
24 (a)	Point B correctly labelled		1	B1
(b)	Using a bearing east of A and using bearing 037° from B		2	B1
	Point M correct and correctly labelled			B1
(c)		22.6 km $(\pm 0.5 km = 1mm)$	1	B1
				Total 4 marks

Question	Working	Answer	Mark	Notes
25 (a)		arc, centre A, 6cm radius drawn	1	B1
(b)	Angle bisector, arcs drawn		2	M1
		Angle bisector drawn from A into $ABCD$ and is at least 6 cm long.		A1
(c)		6.9 (± 0.2) cm	1	B1
(d)		Region shaded	1	B1
				Total 5 marks

Question	Working	Answer	Mark	Notes
26 (a)	$12 = 2\pi r$			M1 oe
	Area $= \dfrac{72}{360} \times \pi \times \left(\dfrac{6}{\pi}\right)^2$		3	M1 dep
		Area $= \dfrac{36}{5\pi}\,\text{cm}^2$		A1 awrt $0.73\,\pi$
(b)	$\dfrac{72}{360} \times 12 + "\dfrac{6}{\pi}" + "\dfrac{6}{\pi}"$			M1
	3 correct lengths		3	M1 dep
		$\dfrac{12(\pi+5)}{5\pi}$		A1 cc
				Total 6 marks

Question	Working	Answer	Mark	Notes
27 (a)	One of $\dfrac{1}{2}$ or $+\dfrac{1}{2x^2}$		2	M1 oe
		$\dfrac{1}{2} + \dfrac{1}{2x^2}$		A1 oe
(b)	$"\dfrac{1}{2} + \dfrac{1}{2x^2}" = \dfrac{3}{x} - 2$			M1 oe
	$x^2 + 1 = 6x - 4x^2$			M1 dep
		$5x^2 - 6x + 1 = 0$	5	A1
	$(5x - 1)(x - 1)$			M1
		$x = \dfrac{1}{5},\ 1$		A1
				Total 7 marks

Question	Working	Answer	Mark	Notes
28 (a)	$\dfrac{5}{\sin 60} = \dfrac{AC}{\sin 40}$		3	M1
	$AC = \dfrac{5 \times \sin 40}{\sin 60}$			M1 dep
		$AC = 3.71\ (3.711)$		A1
(b)	$\dfrac{DC}{"3.711"} = \tan 60 \quad (DC = 6.428)$		4	M1
	$\angle BCD = 10^{o}$			M1
	$\Delta BCD = \dfrac{1}{2} \times 5 \times ""6.428"\times \sin"10"$			M1 dep
	OR			**OR**
	One of $\dfrac{1}{2} \times "6.428" \times "3.71"$ OR $\dfrac{1}{2} \times 5 \times "3.711" \times \sin 80$			M1
	$\Delta BCD = \dfrac{1}{2} \times "6.428" \times "3.71"$ **-** $\dfrac{1}{2} \times 5 \times "3.711" \times \sin 80$			M1 dep
		$\Delta BCD = 2.79$		A1
				Total 7 marks

www.dynamicpapers.com

Question	Working	Answer	Mark	Notes		
29	$A = \dfrac{\lambda}{1} L$		4	M1	oe	
	$\therefore B = L - A = L - \dfrac{\lambda}{1} L = L(1-\lambda)$			M1	dep	
	$\left(\therefore A : B = \lambda : 1-\lambda\right)$ $\therefore A : B = \dfrac{\lambda}{1-\lambda} : 1$			M1	dep	
	OR			**OR**		
	$\therefore (1-\lambda)A = \lambda B$			M1	dep	
	$\therefore \dfrac{A}{B} = \dfrac{\lambda}{1-\lambda}$			M1	dep	
		$\therefore \mu = \dfrac{\lambda}{1-\lambda}$		A1		
						Total 4 marks