

CAMBRIDGE INTERNATIONAL MATHEMATICS

Paper 4 (Extended) SPECIMEN MARK SCHEME 0607/04 For Examination from 2010

2 hours 15 minutes

MAXIMUM MARK: 120

This document consists of 6 printed pages.



TYPES OF MARK

- M marks are given for a correct method.
- A marks are given for an accurate answer following a correct method.
- **B** marks are given for a correct statement or step.
- **D** marks are given for clear and appropriately accurate drawing.
- **P** marks are given for accurate plotting of points.
- E marks are given for correctly explaining or establishing a given result.
- C marks are given for clear communication (Papers 5 and 6 only).
- **R** marks are given for appropriate reasoning (Papers 5 and 6 only).
- ft Follow through
- oe Or equivalent
- soi Seen or implied
- www Without wrong working

1	(a)		112 (km/h)	M1A1	M1 for dist ÷ time seen
	(b)	(i)	0.9 × 112 252 ÷ their new speed 11 20 ft	M1A1 M1 A1	(2.5 h)
		(ii)	$\frac{0.25}{2.25} \times 100$ oe	M1	
			11.1 ft	A1	
	(c)		5.9 km	B1	
			2.19 (mins) ft	M1 A1	M1 for <i>their</i> $5.9 \div 162 \ge 60 \pmod{5.5}$
			2.19 (mms) it	AI	[11]
2	(a)		0.5 or $\frac{1}{2}$	B1	
	(b)		-1.5	M1 A1	M1 for $5 = 2(1 - x)$ or diagram of correct graph(s) which would give answer without need for more graphs
	(c)		$y = \frac{5}{1-x}$ $y(1-x) = 5$ $y-5 = xy$ $\frac{y-5}{y} = x$ $(f^{1}(x)) = \frac{x-5}{x}$	M1 M1 M1 A1	Alternative methods $x = \frac{5}{1-y} M1 \text{first step} \frac{5}{x} M2$ $x(1-y) = 5 M1$ $x-5 = xy M1 \text{then} 1-\frac{5}{x} A2$ $\frac{x-5}{x}(=y) A1$ [7]
					[7]
3	(a)	(i)	(5, -7)	B1	
		(ii)	Reflection in line $y = x$	B3	If B0, M1 for showing the reflection correctly oe M1 (depend) for showing rotation of first image correctly oe
	(b)		c = 2d oe	M1	Setting up two equations
			2c + 3d = 21 $7d = 21$	A1 M1	(depend) for correctly eliminating one variable
			c = 6, d = 3	A1	[8]

4			11.00	D.	
4	(a)	(i)	116°	B2	B1 for right-angle soi at A or B
		(ii)	32° ft	B2	If B0, M1 for 0.5(180 – their 116) o.e. seen
		(iii)	61° ft	B2	B1 for angle $ADB = \frac{1}{2}$ of <i>their 116</i> seen
		(iv)	7° ft	B2	B1 for angle $DAX = 80 - \frac{1}{2}$ of <i>their</i> 116
	(b)		Opposite angles of a cyclic quadrilateral add up to 180	E1	[9]
5	(a)		-0.32, 1.19	M2	SC3 for correct answers but to more
-	()				than 2 dp
				A2	M2 for diagram of correct graph(s) which would give answer without need for more graphs or for $\frac{7 \pm \sqrt{49 - 4 \times 8 \times -3}}{2 \times 8}$ or $\frac{-7 \pm \sqrt{49 - 4 \times -8 \times 3}}{2 \times -8}$
	(b)		-0.32 < x < 1.19	B1	ft their solution to (a) – not just their answers to (a) [5]
6	(a)		y = 2x + 2	В3	Must include y, otherwise B2 If B0, allow B1 for each correct part with $y = 1$, i.e 2x or 2
	(b)		Gradient = -0.5 ft Mid-point = (1.5, 5) $5 = -0.5 \times 1.5 + c$ oe y = -0.5x + 5.75 oe 2x + 4y = 23	B1 B1 M1 A1 B1	ft their gradient and their midpoint ft from an equation form with three terms [8]
7	(a)		5.63 (cm)	B2	If B0, M1 for 12sin28°
	(b)		$BC = 12\cos 28^{\circ}$	M1	
			Area of one end = $0.5 \times theirAB \times theirBC$ Area of rectangles	M1	
			12×30 theirAB × 30 theirBC × 30	M1	for any one
			2 triangles + 3 rectangles	M1	
			907 (cm ²)	A1	(906.5) [7]

(b) $\begin{pmatrix} -2, 0 \\ (2, 0) \\ (0, 4) \end{pmatrix}$ $\begin{bmatrix} B1 \\ B1 \\ B1 \\ B1 \end{bmatrix}$ (c) $(0, -1.5)$ $B1$ (d) $(0.816, -2.59)$ $B1, B1$ (e) (i) $1.7(0)$ $B1$ (ii) $1.8(0)$ $B1$ (iii) $\pm 2.45, \pm 1.41$ $B4$ one each (f) 4 $B1$ [17] 10 (a) (i) $A \cap B$ $B1$ (ii) $B \cup A'$ $B1$ allow $(A \cap B')'$						
A1 A1 A1 for correct answer not to 2 dg (must be at least 1 dg) 78.54 A1 (c) (1, 5), (-1, -1), (7, -1),	8	(a)		5		M1 for $\sqrt{4^2 + 3^2}$
78.54 A1 (must be at least 1 dp) (must be at least 1 dp) (c) (i) $(-1, 5), (-1, -1), (7$		(b)				
(c) (i) $(-1, 5), (-1, -1), (7,$				78 54		
(ii) 48 B1 B1 Correct lengths soi 9 (a) Each correct shape B1B1 B1B1 Correct position with respect to axes. (b) $(-2, 0)$ (2, 0) (0, 4) B1B1B1 Correct position with respect to axes. (b) $(-2, 0)(0, 4) B1B1 Correct position with respect to axes. (c) (0, -1.5) B1 (d) (0.816, -2.59) B1,B1 (e) (i) 1.7(0) B1 (ii) 1.8(0) B1 (iii) 1.245, \pm 1.41 B4 one each (f) 4 B1 [17] 10 (a) 0.0 A \cap B B1 (iii) B \cup A' B1 allow (A \cap B')' (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) \frac{8}{24} oc B1 A1 (iv) \frac{3}{24} \times \frac{2}{23}\frac{6}{552} oc A1 (v) \frac{3}{24} \times \frac{2}{5} - \frac{6}{30} oc M1A1 $					AI	
B1 [9] 9 (a) Each correct shape B1B1 B1B1 B1B1 Correct position with respect to axes. (b) $\begin{pmatrix} -2, 0 \\ 2, 0 \\ 0, 4 \end{pmatrix}$ B1 B1 B1 Correct position with respect to axes. (c) $(0, -1.5)$ B1 (d) $(0.816, -2.59)$ B1,B1 (e) (1) $1.7(0)$ B1 (ii) $1.8(0)$ B1 (iii) $\pm 245, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) $\frac{8}{24}$ ore B1 A1 (iv) $\frac{3}{24} \times \frac{2}{23}$ A1 (iv) $\frac{3}{24} \times \frac{2}{23}$ A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ ore M1		(c)	(i)	(-1, 5), (-1, -1), (7, -1)	В2	B1 if two points correct
B1 [9] 9 (a) Each correct shape B1B1 B1B1 B1B1 Correct position with respect to axes. (b) $\begin{pmatrix} -2, 0 \\ 2, 0 \\ 0, 4 \end{pmatrix}$ B1 B1 B1 Correct position with respect to axes. (c) $(0, -1.5)$ B1 (d) $(0.816, -2.59)$ B1,B1 (e) (1) $1.7(0)$ B1 (ii) $1.8(0)$ B1 (iii) $\pm 245, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) $\frac{8}{24}$ ore B1 A1 (iv) $\frac{3}{24} \times \frac{2}{23}$ A1 (iv) $\frac{3}{24} \times \frac{2}{23}$ A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ ore M1			(ii)	48	B1	Correct lengths soi
9 (a) Each correct shape B1B1 B1B1 (2,0) (0,4) Correct position with respect to axes. (b) $(-2,0)$ (2,0) (0,4) B1 B1 B1 B1 B1 B1 B1 Correct position with respect to axes. (c) $(0,-1.5)$ B1 B1 B1 (c) $(0,-1.5)$ B1 B1 (d) $(0.816,-2.59)$ B1,B1 One each (ii) $1.8(0)$ B1 B1 (iii) $12.45, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) $\frac{8}{24}$ oe B1 B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 A1					B1	
B1B1 Correct position with respect to axes. (b) $(-2, 0)$ B1 (c) $(0, -1.5)$ B1 (d) $(0.816, -2.59)$ B1,B1 (e) (i) $1.7(0)$ B1 (ii) $1.8(0)$ B1 (iii) $12.45, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) $\frac{8}{24}$ oe B1 B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 at A^{11} (v) $\frac{3}{24} \times \frac{2}{23}$ M1 at A^{11} (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 at A^{11}						[9]
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	9	(a)		Each correct shape		Correct position with respect to axes.
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		(b)		(-2, 0)	B1	
(c) $(0, -1.5)$ B1 (d) $(0.816, -2.59)$ B1,B1 (e) (i) $1.7(0)$ B1 (ii) $1.8(0)$ B1 (iii) $\pm 2.45, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) 1 B1 B1 (iii) $\frac{8}{24}$ oe B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 (iv) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1				(2, 0)		
(d) $(0.816, -2.59)$ $B1,B1$ (e) (i) $1.7(0)$ $B1$ (ii) $1.8(0)$ $B1$ (iii) $\pm 2.45, \pm 1.41$ $B4$ one each (f) 4 $B1$ $[17]$ 10 (a) (i) $A \cap B$ $B1$ (ii) $B \cup A'$ $B1$ allow $(A \cap B')'$ (b) (i) 6 $B2$ $B1$ for 8 or 4 in the appropriate region (iii) 1 $B1$ $B1$ $B1$ (iii) $\frac{8}{24}$ oe $B1$ $A1$ (iv) $\frac{3}{24} \times \frac{2}{23}$ $A1$ $A1$ (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe $M1$ $A1$				(0, 4)	BI	
(e) (i) $1.7(0)$ B1 (ii) $1.8(0)$ B1 (iii) $\pm 2.45, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) 1 B1 B1 (iii) $\frac{8}{24}$ oe B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 A1 $\frac{6}{552}$ oe A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 A1		(c)		(0, -1.5)	B1	
(ii) $1.8(0)$ B1 (iii) $\pm 2.45, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) 1 B1 B1 (iii) $\frac{8}{24}$ oe B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 $\frac{6}{552}$ oe A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1		(d)		(0.816, -2.59)	B1,B1	
(iii) $\pm 2.45, \pm 1.41$ B4 one each (f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 allow $(A \cap B')'$ (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) 1 B1 B1 B1 (iii) $\frac{8}{24}$ oe B1 B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 A1		(e)	(i)	1.7(0)	B1	
(f) 4 B1 [17] 10 (a) (i) $A \cap B$ B1 allow $(A \cap B')'$ (ii) $B \cup A'$ B1 allow $(A \cap B')'$ (b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (iii) 1 B1 B1 (iii) 1 B1 (iii) $\frac{8}{24}$ oe B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 $\frac{6}{552}$ oe A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1			(ii)	1.8(0)	B1	
10(a)(i) $A \cap B$ B1(ii) $B \cup A'$ B1allow $(A \cap B')'$ (b)(i)6B2B1 for 8 or 4 in the appropriate region(iii)1B1(iii) $\frac{8}{24}$ oeB1(iii) $\frac{3}{24} \times \frac{2}{23}$ M1 A1(iv) $\frac{3}{24} \times \frac{2}{23}$ oeA1(v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oeM1 A1			(iii)	$\pm 2.45, \pm 1.41$	B4	one each
(ii) $B \cup A'$ (b) (i) 6 (ii) 1 (iii) $\frac{8}{24}$ oe (iv) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe (i) $B \cup A'$ B1 allow $(A \cap B')'$ B2 B1 for 8 or 4 in the appropriate B1 B1 B1 B1 B1 A1 A1 A1 A1 A1 A1 A1 A1 A1 A		(f)		4	B1	[17]
(b) (i) 6 B2 B1 for 8 or 4 in the appropriate region (ii) 1 B1 (iii) $\frac{8}{24}$ oe B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 $\frac{6}{552}$ oe A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1	10	(a)	(i)	$A \cap B$	B1	
(ii) 1 B1 (iii) $\frac{8}{24}$ oe B1 (iv) $\frac{3}{24} \times \frac{2}{23}$ M1 $\frac{6}{552}$ oe A1 (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1			(ii)	$B \cup A'$	B1	allow $(A \cap B')'$
(iii) $\frac{8}{24}$ oe (iv) $\frac{3}{24} \times \frac{2}{23}$ $\frac{6}{552}$ oe (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 A1 M1 A1 A1 A1 A1		(b)	(i)	6	B2	B1 for 8 or 4 in the appropriate region
(iv) $\frac{\overline{24}}{3} \stackrel{\text{oe}}{=} \frac{1}{23}$ $\frac{6}{552} \stackrel{\text{oe}}{=} \frac{6}{30}$ oe $\frac{1}{31}$ (v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe $\frac{1}{31}$			(ii)	1	B1	
(iv) $\begin{vmatrix} \frac{3}{24} \times \frac{2}{23} \\ \frac{6}{552} & \text{oe} \\ (v) & \frac{3}{6} \times \frac{2}{5} = \frac{6}{30} & \text{oe} \\ \end{vmatrix}$ M1 A1 A1 A1			(iii)	$\frac{8}{24}$ oe	B1	
(v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 A1						
(v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 A1			(iv)	$\frac{3}{3} \times \frac{2}{3}$		
(v) $\frac{3}{6} \times \frac{2}{5} = \frac{6}{30}$ oe M1 A1				24 23	AI	
				$\frac{6}{552}$ oe	A1	
			(v)	$\frac{3}{2} \times \frac{2}{6} = \frac{6}{6}$		
(vi) 5 B2 B1 for 17 seen or correct shading				$\frac{1}{6} - \frac{1}{5} - \frac{1}{30}$ be	A1	
[13]			(vi)	5	B2	B1 for 17 seen or correct shading [13]

11	(a)	(i)	65.5	B1	
		(ii)	51.5	B1	
	(b)	(i)	67.5	B1	
		(ii)	50	B1	
	(c)	(i)	25	B1	
		(ii)	15	B1	
	(d)		Maths higher average Maths higher spread	B1 B1	
	(e)	(i)	10 points correctly plotted	P3	P2 for 9 points, P1 for 8
		(ii)	Line through (\bar{x}, \bar{y}) Ruled and reasonable	M1 A1	
	(f)		Negative o.e Strong o.e.	M1 A1	
	(g)	(i)	(y =) -0.548x + 87.4	B1,B1	
		(ii)	53	B1	Allow 52.9 [18]
12	(a)		$11^2 + 21^2 - 13^2$	M1	Using the Cosine Rule.
			$(\cos P) = \frac{11^2 + 21^2 - 13^2}{2 \times 11 \times 21}$	A1	Correct substitution.
			(angle P) = 31.7°	A1	
	(b)		Bearing = $70 + 31.7 = 101.7^{\circ}$ $11 + 1.5 \times 20$ and $21 + 1.5 \times 15$ $(42^{\circ}) \times 12^{\circ} + 42.5^{\circ}$	E1 M1 A1	(dependent)
			$(AB^2 =) 41^2 + 43.5^2 - 2 \times 41 \times 43.5$ cos 31.7°	M1	ft their <i>PA</i> , <i>PB</i> (538.4)
			23.2 (km)	A1	[8]