

**MARK SCHEME for the May/June 2010 question paper  
for the guidance of teachers**

**4024 MATHEMATICS (SYLLABUS D)**

**4024/12**

Paper 12, maximum raw mark 80

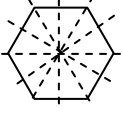
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	<b>GCE O LEVEL – May/June 2010</b>	<b>4024</b>	<b>12</b>

<b>Qu</b>	<b>Answers</b>	<b>Mark</b>	<b>Part Marks</b>
<b>1</b>	(a) 0.7 (b) 60	1 1	
<b>2</b>	(a) $\frac{11}{35}$ (b) $\frac{18}{35}$	1 1	
<b>3</b>	(a) 22 (b) 1380	1 1	
<b>4</b>	(a) 10 (b) $\frac{1}{3}$	1 1	
<b>5</b>	0.5	2	B1 for two of 50, 0.2 and 4 seen
<b>6</b>	(a) 2.5 (b) $\frac{p+r}{2}$	1 1	
<b>7</b>	(a)  (b) Rectangle, parallelogram or rhombus drawn	1 1	
<b>8</b>	(a) 81 (b) 24	1 1	
<b>9</b>	(a) $2^2 \times 5 \times 7$ (b) 28 (c) 42	1 1 1	
<b>10</b>	(a) 40 24 (b) 2.5	2 1	C1 for one correct or M1 for $\frac{x}{x-16}$ or $\frac{y+16}{y} = \frac{5}{3}$ or $\frac{5}{8}z = \frac{3}{8}z + 16$
<b>11</b>	(a) -1.5 (b) $\frac{5}{3x+2}$	1 2	C1 for $\frac{5}{3y+2}$ or $\frac{5}{ax+b}$ with $a = 3$ or $b = 2$ or B1 for $3xy = 5 - 2x$ or $3yx = 5 - 2y$ or better seen

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12	(a) $\frac{12}{x^2}$	2	C1 for $\frac{k}{x^2}$ or B1 for $k = 12$ seen or $y = \frac{k}{x^2}$ with $k$ or $k$ any number
	(b) 2 -2	1	
13	(x =) 5 (y =) -4	3	C2 for one correct with working. M1 for a correct method to eliminate one variable, reaching such as $11x = k$ , $hx = 55$ , $11y = p$ or $qy = -44$
14	(a) -2 5.5	1	
	(b) $y = -0.75x + 4$	2	C1 for $y = -0.75x + c$ or $y = mx + 4$ or B1 for $m = -0.75$ or $c = 4$ soi or a line through either point $(-8, 10)$ or $(4, 1)$
15	(a) 52	1	
	(b) 52	1	Accept their (a) ft
	(c) 38	1	Accept 90 – their (b) ft
16	(a) Correct completion with $\frac{4}{10}$ , $\frac{4}{9}$ , $\frac{6}{9}$ and $\frac{3}{9}$	1	
	(b) $\frac{7}{15}$	2	C2 for a correct ft from (a) M1 for $\frac{6}{10} \times \frac{5}{9} + \frac{4}{10} \times \frac{3}{9}$
17	(a) $2p + 3q$	1	
	(b) $2p + 2q$	1	
	(c) $-2p + q$	1	Accept $3q$ – their (b) ft
18	(a) $\frac{\pi r^2}{6}$	1	
	(b) $2r + \frac{\pi r}{3}$	2	B1 for $\frac{60}{360} \times 2\pi r$ seen
19	(a) $\begin{pmatrix} 3 & -1 \\ 0 & -1 \end{pmatrix}$	1	
	(b) $\begin{pmatrix} 3 & -1 \\ 2 & 1 \\ 1 & 0 \\ 2 & 2 \end{pmatrix}$ o.e.	2	B1 for $\frac{1}{2}$ or $\begin{pmatrix} 3 & -2 \\ 1 & 0 \end{pmatrix}$ or (det =) 2

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20	(a) 39	1	B1 for 46 or 32 seen
	(b) 14	2	
	(c) 9	1	
21	(a) (i) $3x(x - 4)$	1	B1 for $x(x + 4)$ or $(x + 4)(x - 4)$ seen
	(ii) $(x + y)(x - 2y)$	1	
	(b) $\frac{x}{x - 4}$	2	
22	(a) 2 500 000	1	B1 for 5.5 seen
	(b) (i) 395	1	
	(ii) 340	2	
23	(a) 34	2	M1 for $\frac{16}{AB} = \cos\theta$ soi
	(b) 480	2	B1 for height of $ABC = 16 \tan \theta$ o.e. or for $\frac{1}{2} \times 32 \times \text{their } 34 \times \sin \theta$ or M1 for any correct method
24	(a) T with vertices (5, 6), (3, 6) and (3, 2)	2	C1 for two vertices correct or for T same orientation as P and correct size
	(b) Rotation $90^\circ$ anticlockwise about (0, 0)	2	B1 for Rotation or $90^\circ$ anticlockwise about (0, 0) oe
	(c) $\begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$	1	
25	(a) 108	1	C1 for 0.5 – 0.9 or B1 for tangent at $t = 18$  B1 for curve from (0, 0) to (8, 36) with correct curvature or straight line from (8, 36) to (16, 108ft)
	(b) 0.5 – 0.9 with tangent drawn at $t = 18$	2	
	(c) Correct distance / time graph	2	
26	(a) Correct triangle	2	B1 if no arcs seen or arcs seen but sides in the wrong order or arcs seen, but only one side the correct length
	(b) Correct region shaded	3	B1 for arc radius 7, centre B B1 for perp. bisector of AB