

## MARK SCHEME for the October/November 2007 question paper

<b>4024/01</b>	<b>4024 MATHEMATICS</b> Paper 1, maximum raw mark 80
----------------	---

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2007 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

<b>Page 2</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Page</b>
	<b>GCE O LEVEL – October/November 2007</b>	<b>4024</b>	<b>01</b>

<b>1</b>	<b>(a)</b>	$\frac{9}{40}$ cao	1	e.g. $\frac{9}{500}$ , $1.8 \times 10^{-2}$
	<b>(b)</b>	0.018 or equiv.	1	
<b>2</b>	<b>(a)</b>	$\frac{8}{9}$ cao	1	
	<b>(b)</b>	$\frac{1}{6}$ cao	1	
<b>3</b>	<b>(a)</b>	4.32(0)	1	not 4320. Accept $4\frac{32}{100}$ or equiv.
	<b>(b)</b>	$(-1)^3, 3^{-1}, 3^0, 3^1$	1	Accept corresponding correct values
<b>4</b>	<b>(a)</b>	$56^\circ$	1	
	<b>(b)</b>	2 cm	1	
<b>5</b>	<b>(a)</b>	375	1	
	<b>(b)</b>	27	1	
<b>6</b>	<b>(a)</b>	6	1	Accept any correct equiv.
	<b>(b)</b>	$3 - 2x$	1	
<b>7</b>		rectangle from 4-5 height 20	1	
		rectangle from 5-8 height 5	1	
<b>8</b>	<b>(a)</b>	$y > 1$ , $y < 2x$ or equiv.	1+1	or sc1 for using the two correct equations but with the wrong inequalities
	<b>(b)</b>	3	1	
<b>9</b>	<b>(a)</b>	$B \cap C \cap A'$	1	
	<b>(b)</b>	(i) 31 (ii) 9 or f.t. 40 – their (b)(i)	1 1 ✓	
<b>10</b>	<b>(a)</b>	$\begin{pmatrix} 8 & -3 \\ 9 & -4 \end{pmatrix}$	1	Allow $\frac{1}{3} \begin{pmatrix} 0 & 1 \\ -3 & 4 \end{pmatrix}$ Accept decimals to 2 d.p. or better.
	<b>(b)</b>	$\begin{pmatrix} 3 & 0 \\ 0 & 3 \end{pmatrix}$	1	
	<b>(c)</b>	$\begin{pmatrix} 0 & \frac{1}{3} \\ -1 & 1\frac{1}{3} \end{pmatrix}$	1	
<b>11</b>	<b>(a)</b>	5.35 5.45 82.5 87.5	2	or B1 for 2 or 3 correct
	<b>(b)</b>	189.5 g or f.t. from their lower bounds	1 ✓	
<b>12</b>	<b>(a)</b>	120 newtons	1	or B1 for “k” = 24
	<b>(b)</b>	8	2 *	

<b>Page 3</b>	<b>Mark Scheme</b>	<b>Syllabus</b>	<b>Page</b>
	<b>GCE O LEVEL – October/November 2007</b>	<b>4024</b>	<b>01</b>

<b>13</b>	<b>(a)</b>	4 minutes	1																																																				
	<b>(b)</b>	st. line from (0,0) to (their (a), 2h) st. line from (their (a), 2h) to (12, 3h)	1 1	sc1 for a single straight line from (0,0) to (12,3h) regardless of the value in (a).																																																			
<b>14</b>	<b>(a)</b>	$x = 28$	1																																																				
	<b>(b)</b>	$y = \frac{2}{3}$ (accept 0.66... or better)	2 *	or B1 for $-10 + 2y$ or $-5 + y$ seen																																																			
<b>15</b>		Any 3 correct columns in their table. Most possible values are given here:	1 *																																																				
<table border="1"> <tr> <td>W</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td> </tr> <tr> <td>L</td><td>33</td><td>31</td><td>29</td><td>27</td><td>25</td><td>23</td><td>21</td><td>19</td><td>17</td><td>15</td><td>13</td><td>11</td><td>9</td><td>7</td><td>5</td><td>3</td> </tr> <tr> <td>A</td><td>99</td><td>124</td><td>145</td><td>162</td><td>175</td><td>184</td><td>189</td><td>190</td><td>187</td><td>180</td><td>169</td><td>154</td><td>135</td><td>112</td><td>85</td><td>54</td> </tr> </table>					W	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	L	33	31	29	27	25	23	21	19	17	15	13	11	9	7	5	3	A	99	124	145	162	175	184	189	190	187	180	169	154	135	112	85	54
W	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																																							
L	33	31	29	27	25	23	21	19	17	15	13	11	9	7	5	3																																							
A	99	124	145	162	175	184	189	190	187	180	169	154	135	112	85	54																																							
		Length = 19 m Area = 190 m <sup>2</sup>	1 1																																																				
<b>16</b>		$x = 7$ $y = -2$	both	3 or B2 for either or B1 for a pair of values that fits either equation																																																			
<b>17</b>	<b>(a)</b>	<b>(i)</b> $5 \times 10^{-2}$	1																																																				
		<b>(ii)</b> $2 \times 10^2$	1																																																				
	<b>(b)</b>	<b>(i)</b> $2 \times 3^2 \times 5^3$ (or $2^1 \times 3^2 \times 5^3$ )	1	Accept 3x3 etc.																																																			
		<b>(ii)</b> $n = 12$	1																																																				
<b>18</b>	<b>(a)</b>	$\frac{360}{180-165}$ or $180(n-2) = 165n$ or equiv	M1																																																				
		24	A1	2 *																																																			
	<b>(b)</b>	45		2 * or B1 for 30 or 150 seen																																																			
<b>19</b>	<b>(a)</b>	40		2 * or sc1 for 48 or 50, or for an answer that rounds to 40 or B1 for both 16 and 30, or 480, or $\sqrt{150} \approx 12$ seen																																																			
	<b>(b)</b>	$\frac{\text{their } 100\text{m}}{\text{their } 12\text{s}}$ or $500 \times 60$	M1																																																				
		30 km/h	A1	2 * Accept 29.8 to 30.31																																																			
<b>20</b>	<b>(a)</b>	$3a^2 (5 + 4a)$	1																																																				
	<b>(b)</b>	$(1 - 4b)(1 + 4b)$	1																																																				
	<b>(c)</b>	$(3c - d)(2x - y)$	2 *	or B1 for correct, partial factorisation of any two terms																																																			

Page 4	Mark Scheme	Syllabus	Page
	GCE O LEVEL – October/November 2007	4024	01

21	(a)	$h = \frac{1}{4}$ or 0.25		1		
	(b)	(i)	$\frac{3}{10}$ or 0.3		1	
		(ii)	0 cao		1	
		(iii)	$\frac{1}{10}$ or 0.1		1	
22	(a)	clear $30 + (300 - \frac{1}{2} \times 30 \times "12") \div "12"$ 40 s	M1 A1	2 *	or sc1 for a final answer of 10 or B1 for 180 or 120 seen	
	(b)	tangent drawn at $t = 55$ 0.12 to 0.24 ( + or - )	T1 B1	2 *	no "daylight", nor freehand dep. on using an acceptable tangent	
23	(a)	20°C		1		
	(b)	(i)	4°C		1	
		(ii)	2400 m		1	
	(iii)	$16 - \frac{x}{150}$		2	or sc1 for $\frac{\text{their (a)}}{3000} \times x$	
24	(a)	(4) 8, 16, 12		1		
	(b)	$x = 2n$		1		
		$y = n^2$		1		
		$z = n^2 - n$ or equiv		2	or sc1 for a correct expression in terms of $x$ and/or $y$ (and possibly also including the variable $n$ )	
25	(a)	293° to 295°		1		
	(b)	completed $\triangle ACD$ with two arcs at $D$		1	within 2 mm of correct pt	
	(c)	(i)	perp. bisector of $AC$		1	within 2 mm, 2°
		(ii)	line parallel to $AB$ , 5 cm above $AB$		1	within 2 mm Accept dashed lines.
(d)	$CP = 6.3$ to $6.7$		1	dep. on the correct loci and the label $P$ at their intersection		