

November 2003

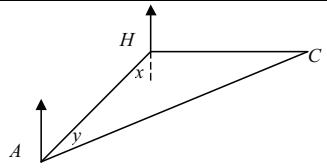
MARK SCHEME 5503				
Number	Working	Answer	Mark	Notes
1 (a)		41, 43, 47	2	B2 3 <sub>✓</sub> & 0 <sub>×</sub>
(b)		1000	1	(B1 for 2 <sub>✓</sub> & ≤ 1 <sub>×</sub> ) B1 cao
2			3	B3 for correct triangle and arcs (see overlay) (B2 for correct triangle with no/incorrect arcs OR for 2 correct sides and arcs) (B1 for 2 correct sides)
3	504 or 104 1680 2080	21.84	3	M1 for complete correct method with relative place value correct, condone 1 arithmetical error A2 cao (A1 for digits 2184 seen or ft if M1 awarded)
4 (a)		$\frac{5}{22}$	1	B1 cao
(b)		$\frac{7}{22}$	1	B1 ft $\sum f$ used in (a) provided $\Sigma = 22 \pm 2$
(c)		$\frac{9}{22}$	1	B1 ft $\sum f$ used in (a) provided $\Sigma = 22 \pm 2$
5 (a)	$\frac{60}{100} \times 840$	504	2	M1 e.g. for $\frac{60}{100} \times 840$ A1 cao
(b)	480 ÷ 6	80	2	M1 for 480 ÷ 6 oe A1 cao
(c)	10% = 68, 20% = 136 or $\frac{100}{40}$ oe seen	680	2	M1 for 10% = 68, 20% = 136 or $\frac{100}{40}$ oe seen A1 cao
6 (a)		12, 17	1	B1 cao
(b)	7 + (9 or 10) × 5	52	2	M1 for correct method to find the 10 <sup>th</sup> or 11 <sup>th</sup> term, condone one arithmetical error. A1 cao
(c)		5n + 2	2	B2 for 5n + 2 oe (B1 for 5n seen)

Number	Working	Answer	Mark	Notes
7	(a) $3 \times 5 + 4 \times -2$	7	2	M1 for $3 \times 5 + 4 \times -2$ A1 cao
	(b) $4x - 3 = 11$ $4x = 11 + 3$		3	M1 for $4x - 3 = 11$ M1 for $4x = 11 + 3$  A1 for $3\frac{1}{2}$ oe
	(c)	$3\frac{1}{2}$ oe $7n - 21$	1	B1 cao
	(d)	$t(t - 5)$	2	B2 cao [B1 for $t(\dots)$ ]
8	(a) $20 \times 3 \div 5$ oe	12	2	M1 for $20 \times 3 \div 5$ oe A1 cao
	(b) $350 \div 5$ or 70	280	2	M1 for $350 \div 5$ or 70 seen A1 cao
9	Splits up shape e.g. into rectangle and triangle $9 \times 8$ or 72 $\frac{1}{2} \times "12" \times "5"$ or 30	102	4	M1 for splitting up shape  M1 (indep) for a correct method to find area of one part, e.g. $9 \times 8$ or 72  M1 for a correct method to find area of other part (s), e.g. $\frac{1}{2} \times "12" \times "5"$ or 30  A1 cao

Number	Working	Answer	Mark	Notes
10 (a)	$\begin{array}{r} 2 \overline{)120} \\ 2 \overline{)60} \\ 2 \overline{)30} \\ \text{e.g. } 3 \overline{)15} \\ 5 \overline{)5} \\ 1 \end{array}$	$2^3 \times 3 \times 5$	3	<p>M2 for a full systematic method of at least 4 divisions by prime numbers or factor trees, condone one calculation error.  (M1 for 120 written as either <math>2 \times 60</math> or <math>3 \times 40</math> or <math>5 \times 24</math> or equivalent division or a full process with 2 calculation errors)  A1 for <math>2^3 \times 3 \times 5</math> (accept <math>2 \times 2 \times 2 \times 3 \times 5</math>)</p>
(b)	<p>e.g.</p> $150 = 2 \times 3 \times 5^2$ <p>LCM =</p> $2^3 \times 3 \times 5^2$	600	2	<p>B2 cao  (B1 for either a multiple of 600 or numerical expression equal to 600)</p>

Number	Working	Answer	Mark	Notes
11	(a) $30^3 15$ (i)  (ii) (b)  (c) $80\% = 520$ $\frac{520}{80} \times 100$	450  9 $\frac{A}{50}$  650	3   2  3	M1 for $30^3 15$ A1 cao  A1 ft from "450"  B2 $\frac{A}{50}$ oe (B1 for $50n$ seen) M1 for $(100 - 20)\% = 520$  M1 Dep for $\frac{520}{80} \times 100$ A1 cao
12		14   7 7 7 8 15   1 2 3 5 8 8 16   4 5 6 6 7 17   1 2 8 18   9 9  Key 17   8 means 178 (mm)	3	B1 stem correct  B1 for accurate unordered leaves (condone 1 error or omission)  B1 for key and ordered and leaves all correct
13	$8^3 1000000$	8000000	2	M1 for $100^3 100^3 100$ A1 cao

Number	Working	Answer	Mark	Notes
14	(a) $\frac{16}{40} + \frac{15}{40}$	$\frac{31}{40}$	2	M1 for $\frac{16}{40} + \frac{15}{40}$ correctly writing both fractions to a common denominator. A1 for $\frac{31}{40}$ oe
	(b) $\frac{17}{3} - \frac{11}{4}$ Or 5-2 & $\frac{2}{3} - \frac{3}{4}$ oe $\frac{68}{12} - \frac{33}{12}$ or $\frac{8}{12} - \frac{9}{12}$ oe	$2\frac{11}{12}$	3	M1 for correctly decomposing into non mixed numbers  M1 ft for correct method to write all fractions to a common denominator  A1 for $\frac{35}{12}$ oe single fraction or mixed number SC: B3 for 2.916 (B1 for 5.6 – 2.75 oe decimals)
15	(i)	$p^9$	2	B1 cao
	(ii)	$x^5$		B1 cao
16	(a)	44800 $\frac{1}{2}$ 5	2	M1 for 44800 $\frac{1}{2}$ 5 A1 cao
	(b)	7130 $^3$ 5	2	M1 for 7130 $^3$ 5 A1 cao
17	$\frac{7}{20} \times 300$	105	3	M1 for either $\frac{7}{20}$ oe or $\frac{300}{20}$ oe (condone slip in $\Sigma f$ )  M1 for $\frac{7}{20} \times 300$ oe (condone slip in $\Sigma f$ ) OR $\frac{105}{300}$ seen A1 cao

Number	Working	Answer	Mark	Notes
18	(a) $\frac{125}{200}$	$\frac{5}{8}$	2	M1 for $\frac{125}{200}$ A1 cao
	(b) $\frac{3w+20}{200}=1$ $3w + 20 = 200$	60	3	M1 $\rho = 1$ stated or used  M1 dep $3w + 20 = 200$ oe A1 cao
19	 $x = 72^\circ$ $y = \frac{180 - 162}{2} = 9^\circ$ $72^\circ + 9^\circ = 81^\circ$	081 or 81	3	M1 for (AHC=) $90 + 72 (=162)$ accept $x$ marked as $72$ and CHS as $90$ or symbol M1 dep for $(y =) \frac{180 - "162"}{2} (= 9)$ A1 cao  <u>ALIn</u> Draws line from A parallel to HC M1 for $z = w$ and $y + z = 90 - 72 (=18)$ M1 dep for $y$ (or $z$ ) = $\frac{"18"}{2}$
20	$\frac{1}{2}ac, a(b+c), \pi a^2$		3	B3 B1 <sup>3</sup> 3 (deduct B1 for each additional expression (>3) to min 0)
21	(a)	5, 23, 35, 39, 40	1	B1 for all correct
	(b) (175,5) (180,23) (185,35) (190,39) (195,40)	Points correct  curve or line segments	2	B1 ft for at least 4 of 5 pts plotted correctly (— ½ sq) at ends of interval dep on sensible table B1 ft (dep on previous B1) for pts joined by curve/line segments provided no gradient is negative. (SC:B1 if 4 or 5 pts plotted not at ends but consistently within each interval <b>and</b> joined)
	(c)	-179	1	B1 ft from <i>cf</i> graph using <i>cf</i> = 20 or 20.5

Number	Working	Answer	Mark	Notes
22	(a) $\left(\frac{x+2+x+6}{2}\right)(x-5)$ $(x+4)(x-5)$ $x^2 - 5x + 4x - 20$ $x^2 - x - 20 = 36$	Printed	4	B1 for $\left(\frac{x+2+x+6}{2}\right)(x-5)$ or for any correct unsimplified form for the area M1 for at least 3 terms correct in expansion of the form $(x+a)(x+b)$ or $(2x+a)(x+b)$ A1 for area = $x^2 - 5x + 4x - 20$ or better
	(b) (i) $(x-8)(x+7)=0$	8, -7	4	A1 for $x^2 - x - 56(=0)$ obtained convincingly M1 for $(x\pm 8)(x\pm 7)=0$ or correct substitution into quadratic formula (condone sign errors) A2 cao (B1 for either $x = -7$ or $x = 8$ )
	(ii)	3		B1 cao (the only value)
23	(a) Angle in a semi circle (is a right angle)	90	2	B1 cao B1 for a valid reason
	(b) Angles in the same segment (are equal)	56	2	B1 cao B1 for reason
	(c) Angle at the centre is twice the angle at the circumference	112	2	B1 cao B1 for reason