4400 IGCSE Mathematics
November 2007
Paper 4H

Q		Working	Answer	Mark	Notes	
1.		$\frac{1.6}{2.5}$		**2**	M1	for 1.6 or 2.5 seen or for 2.430…
			0.64		A1	Accept $\frac{16}{25}$
						Total 2 marks

2.	(a)		$5(x - 4)$	**1**	B1	cao
	(b)		$y(y + 6)$	**2**	B2	B1 for factors, which, when expanded and simplified, give two terms, one of which is correct except $(y + 6)(y - 6)$ and similar SC B1 for $y(y + 6y)$
						Total 3 marks

3.		630 × 1.45 ÷ 2.61		**2**	M1	for $\frac{630}{2.61}$ or 241.38 or better or 241.37 or 630 × 1.45 or 913.5 or 0.55… seen or 1.8 seen
			350		A1	Accept 349.99 or 350
						Total 2 marks

4.		Reflection in $x = 4$		**2**	B1	for reflection, reflect
					B1	for $x = 4$ stated or eg 'in dotted line'
						Total 2 marks

5.		72 ÷ 6 or 12 seen		**2**	M1	
			84		A1	cao
						Total 2 marks

6.	(a)(i)		57	**2**	B1	cao	
	(ii)	alternate angles			B1		Do not accept *Z angles* or *F angles*
	(b)	corresponding angles and sum of angles on a straight line is 180° or allied or co-interior angles and (vertically) opposite angles or alternate angles and sum of angles on a straight line is 180°		**2**	B1	for one pair	
			71		B1	cao	
							Total 4 marks

7.	(a)	$\frac{55}{150} \times 60$		**3**	B1 M1	for $\frac{55}{150}$ oe or $\frac{60}{150}$ oe seen for $\frac{55}{150} \times 60$
			22		A1	cao
	(b)	68 × 48 + 58 × 35 = 3264 + 2030		**3**	M1	2 products m × f where m is within each interval and consistent (inc end points)
					M1	(dep) for use of halfway values
			5294		A1	Accept 5300 or 5290 if M1 + M1 scored
	(c)	eg no upper limit for extra large, no lower limit for small, don't know midpoints for XL, S		**1**	B1	
						Total 7 marks

8.	(a)			**2**	B2	B1 for either open circle at −2 or solid circle at 3
	(b)		−1 0 1 2 3	**2**	B2	B1 for all correct + 1 wrong or for four correct and none wrong
						Total 4 marks

9.		arc centre *B* cutting *AB* and *AC* at (say) *P* and *Q*		**2**	B1	
		arcs centre *P* and *Q* of equal radii which intersect at *R* (say) and *BR* joined			B1	(dep) bisector within tolerance
						Total 2 marks

10.	(a)	7 2 (−1) −2 −1 2 7		**2**	B2	B1 for 4 correct
	(b)		graph	**2**	B2	B1 for 5 points plotted correctly ± ½ sq ft from (a) if at least B1 scored B1 for correct curve or, if there are 1 or 2 errors in (a) and no plotting errors, award for a curve passing through the **7** points from their table.
						Total 4 marks

11.		$420 \times \frac{100}{56}$		**3**	M1	for 420 ÷ 56 or 7.5 seen
					M1	(dep) for × 100
			750		A1	cao
						Total 3 marks

12.		$4.9^2 + 16.8^2$ or $24.01 + 282.24$ or 306.25		**3**	M1	for squaring and adding
		$\sqrt{4.9^2 + 16.8^2}$			M1	(dep) for square root
			17.5		A1	cao
						Total 3 marks

13.		$\frac{20805}{1.14}$ or $20805 \times \frac{100}{114}$		**3**	M2	for $\frac{20805}{1.14}$ or $20805 \times \frac{100}{114}$ M1 for $\frac{20805}{114}$, 114% = 20805 or 182.5 seen
			18 250		A1	cao
						Total 4 marks

14.	(a)		$6n^2$	**1**	B1	cao
	(b)		$3x^3y^2$	**2**	B2	B1 for x^3 or y^2
	(c)		t^{12}	**1**	B1	cao
	(d)		$\frac{p^6}{8}$	**2**	B2	B1 for $\frac{1}{8}$ oe or for p^6
						Total 6 marks

15.	(a)	$6.8 \times \frac{15}{10}$		**2**	M1	
			10.2		A1	cao
	(b)	$12.3 \times \frac{10}{15}$		**2**	M1	
			8.2		A1	cao
	(c)	$\frac{15}{10}$ or 1.5 oe		**2**	M1	for $\frac{15}{10}$ or 1.5 oe or for $\left(\frac{10}{15}\right)^2$ or $\frac{4}{9}$ or $0.\dot{4}$ oe or for correct expression which, if accurately evaluated, gives the correct answer or for the area of one of the triangles evaluated correctly Area ΔABC rounds to 62.3 (62.2700…) NOT 62.73 Area ΔCDE rounds to 27.7 (27.6755…) NOT 27.88 Note: the angles of the triangle are 42.5°, 54.5° and 83.1°.
			2.25 oe		A1	for 2.25 or 2¼ or $^9/_4$ or for answer rounding to 2.25 Even if M1 awarded, do not award A1 for a correct answer, if there are any errors in the working.
						Total 6 marks

16.	(a)(i)		15	**2**	B1	cao
	(ii)		7 or 8		B1	
	(b)	26 or 26½		**2**	M1	may be stated or indicated on graph
			54 – 55 inc		A1	
						Total 4 marks

17.	(a)	$72 = 2^3 \times 3^2$ and $90 = 2 \times 3^2 \times 5$ or 2×3^2 or 1,2,3,4,6,8,9,12,18, 24, 36,72 and 1,2,3,5,6,9,10,15,18,30,45,90		**2**	M1	Need not be products of powers; accept products or lists ie 2,2,2,3,3 and 2,3,3,5 Prime factors may be shown as factor trees
			18		A1	cao
	(b)	$2^3 \times 3^2 \times 5$ or 72, 144, 216, 288, 360 and 90, 180, 270, 360		**2**	M1	
			360		A1	cao
						Total 4 marks

18.	(a)	$2y = 6 - x$		**3**	M1	for $2y = 6 - x$ or for stating coordinates of 2 points on line
		$y = 3 - \frac{x}{2}$ or $y = \frac{6-x}{2}$			M1	for correct rearrangement of equation with y as subject or for attempt to find gradient of line joining two stated points
			$-½$		A1	for $-½$ oe dep only on first M1 SC if M0, award B1 for correct ft from incorrect rearrangement
	(b)		$y = -½x + 5$ oe	**1**	B1	correct answer or ft from (a) Equivalent equations include $x + 2y = 10$
						Total 4 marks

19.	(i)		8	**4**	B1	cao
	(ii)		12		B1	cao
	(iii)		0		B1	cao
	(iv)		16		B1	cao
						Total 4 marks

20.	(a)	$\frac{dy}{dx} = 3x^2 - 10x + 8$		**4**	B2	B1 for 2 correct terms
		$3 \times 2^2 - 10 \times 2 + 8$			M1	(dep on at least B1) for substituting x = 2
			0		A1	cao
	(b)	(could be) turning point, max or min, (is) stationary point tangent is parallel to the *x*=axis		**1**	B1	
						Total 5 marks

21.	(a)	bar height 21 little squares		**2**	B1	Allow $\pm$ ½ sq
		bar height 6 little squares			B1	Allow $\pm$ ½ sq
	(b)		8	**1**	B1	cao
						Total 3 marks

22.	(a)(i)		38	**2**	B1	cao
	(ii)	Angles in the same segment oe			B1	Award if 'same segment', 'same arc' or 'same chord' stated or implied
	(b)		52	**2**	B2	B1 for $\angle ADC = 90°$ or $\angle COD = 76°$ stated or indicated on diagram
						Total 4 marks

23.	(a)	$3(2x - 5) + 2$ or $6x - 15 + 2$		**2**	M1	
			$6x - 13$		A1	
	(b)	eg $\begin{matrix}\times 3 \rightarrow +2 \\ \div 3 \leftarrow -2\end{matrix}$ or attempt to make x the subject of $y = 3x + 2$ or $x = 3y + 2$			M1	
			$\frac{x-2}{3}$ oe		A1	
						Total 4 marks

24.		$\frac{3}{5} \times \frac{3}{4} + \frac{2}{5} \times \frac{2}{4}$		**3**	M2	for sum of both products (M1 if one correct product seen)
			$\frac{13}{20}$		A1	
						Total 3 marks

25.	(a)	$3x + x(4 - x) = 11$ or $4x + x(3 - x) = 11$ or $(4 - x)(3 - x) = 1$ or $12 - (4 - x)(3 - x) = 11$		**2**	M1		Award M1 A1 for $4x + 3x - x^2 = 11$
		$3x + 4x - x^2 = 11$ or $4x + 3x - x^2 = 11$ or $12 - 4x - 3x + x^2 = 1$ or $12 - 12 + 4x + 3x - x^2 = 11$			A1		
	(b)	$\frac{7 \pm \sqrt{(-7)^2 - 4 \times 11}}{2}$		**3**	M1	for correct substitution Condone omission of brackets	
		$\frac{7 \pm \sqrt{5}}{2}$			M1	for correct simplification	
			4.62, 2.38		A1	for 3 sf or better (4.61803… , 2.38196…)	
	(c)(i)		2.38	**2**	B1	for 2.38 or better	
	(ii)		eg $x < 3$		B1		
						Total 7 marks	

26.	(a)	$\frac{1}{3}\pi r^2 \times r + \pi r^2 \times r$ or $\frac{1}{3}\pi r^3 + \pi r^3$		**2**	M1		
			$\frac{4}{3}\pi r^3$		A1	dep on M1	
	(b)	$\pi r l + 2\pi r^2 + \pi r^2$ oe		**3**	M1		
		$l > r$ or $l = r\sqrt{2}$ oe			M1		
			$> 4\pi r^2$		A1		
						Total 5 marks	