UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2006 question paper

0580 and 0581 MATHEMATICS

0580/03 and 0581/03 Paper 3, maximum raw mark 104

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

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Question	Answer	Marks	Comments	
1 (a)(i)	translation	1	must be a single transformation	
			not translocation etc	
	(-7)	1	accept in words 7 left	
	(-4)	1	accept in words 4 down	
1 (a)(ii)	enlargement	1	must be a single transformation	
	S.F = 3	1		
	centre (0,0)	1		
1 (b)	correct rotation	2	SC1 for any rotation of 90 anticlockwise	
			or SC1 for correct rotation of 90 clockwise	
1 (c)	correct reflection	2	SC 1 for any reflection in y=k	
			or SC 1 for correct reflection in x= -2	
				10
2 (a)	141 cao	2	M1 for Π x1.5^2 x 20 (imp.by 141.3.....)	
2 (b)	2 h 56 or 2 h 57	3	SC 2 for 176 to 177 mins	
			M1 for (a) / 0.8	
			SC 1 for ft time in mins correctly changed	
			to hours and minutes.(if more than 1 hour)	
2 (c)	36 cao	2	M1 for 12 seen as length of box	
2 (d)(i)	8.6(0) cao	2	M1 for 96 x 0.35 - 25 or 96 x 35 - 2500	
2 (d)(ii)	34.4 or 34	3ft	ft is (d)(i) x 4	
			M1 for (d)(i) / 25	
			M1 (dep) for x 100	
				12

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3 (a)	4p - 3q	2	SC1 for either 4p or -3q seen	
3 (b)	7 cao	3	M1 for 2x - 5 = 9 or 6x - 15 = 27	
			M1 for 2x = 14 or 6x = 42	
3 (c)(i)	2j + 2k	1	or 2 (j + k) or j + j + k + k	
3 (c)(ii)	(c)(i) = 72	1ft		
3 (c)(iii)	24 cao	2	M1 for substitution of k=2j or j=k/2	
			implied by 6j=72 , 3j=36 , ans of 12 , 3k=72	
3 (d)	numerator = 1/6	B1		
	x2	M1	or dividing by 3/6	
	1/3.	A1	SC1 for ans of 1/3 without working	
3 (d)(ii)	wr + t	2	M1 for wr = s - t	
				14
4 (a)	16 , 21 , 26	3	1 , 1 , 1	
4 (b)	101	2	M1 for 5 x 20 + 1 soi.	
4 (c)	5n +1	2	SC1 for 5n + k seen	
4 (d)	37	2	M1 for -1 then /5	
			or SC1 ft from (c) = 186 correctly solved.	
				9

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5 (a)	200	2	M1 for distance / time	
5 (b)(i)	2 squares hori.	1		
	parallel line to 470	1	indep.	
5 (b)(ii)	09 33	1ft	correct time or ft from graph (b)(i)	
			allow + or - 3 mins	
5 (c)(i)	start at (0730 , 470)	1		
	end at (0945 , 0)	1	but must be a straight line	
5 (c)(ii)	280	1ft	ft from graph	
			allow + or - 5 km.	
5 (c)(iii)	208 to 209	2	M1 for distance / time	
				10
6 (a)(i)	163.4 or 163	2	M1 for sum of heights / 10	
6 (a)(ii)	24	2	SC1 for both 178 and 154 seen	
6 (b)(i)	7 points plotted	P2	P1 for 5 or 6 correct	
6 (b)(ii)	line of best fit	L1	judge by eye	
6 (b)(iii)	height for 21cm	1	ft from their line of best fit	
6 (b)(iv)	positive	1		
6 (b)(v)	correct statement	1	larger hand span greater height or equiv.	
				10

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7 (a)	m	1		
7 (b)	y = 2x + 5	2	SC1 for 2x or 5 seen	
7 (c)	8 , 12 , 3	3	1 , 1 , 1	
7 (d)	9 points plotted	P2 ft	P1ft for 6,7 or 8 correct	
			limit for accuracy is 1/2 small square	
	smooth curve drawn	C1	reasonable curve through the 9 correct points	
			not dependent on P2	
7 (e)	(-3.8 , -2.7)	1ft	allow + or - 0.1 ft is from their graph	
	(1.8 , 8.7)	1ft	allow + or - 0.1 ft is from their graph	
				11
8 (a)(i)	pentagon	1		
8 (a)(ii)	72	2	M1 for 360 / 5	
8 (a)(iii)	108	2ft	M1 ft for 180 - (a)(ii)	
8 (b)	(x=) 35	1		
	(y=) 64	2		
	(z=) 81	2	M1 for 180 - (35 + 64) oe. soi	
				10

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9 (a)(i)	85	1	allow + or - 1	
9 (a)(ii)	72	1	allow + or - 2	
9 (b)(i)	angle bisector constructed	2	must have correct arcs seen SC1 for any line from A to BC	
9 (b)(ii)	82 to 84	1ft	ft is length (+/- 1) from line in (b)(i)	
9 (c)	perpendicular bisecter of AC	2	must have correct arcs seen allow +/- 0.1 and +/- 2 degrees SC1 if inaccurate or correct by eye without construction lines seen	
9 (d)	G	2ft	G placed anywhere in the correct region ft only from 2 lines creating a distinct region	9
10 (a)	p=40 , q=50	1	may be seen on the diagram	
10 (b)	37.4	2	M1 for tanACB = 13/17 oe or better	
10 (c)	21.4	2	M1 for $\sqrt{(13^2+17^2)}$, $\sqrt{169+289}$, $\sqrt{458}$	
10 (d)	110.5	2	allow 110 or 111 M1 for 0.5 x 13 x 17	
10 (e)	272 to 273	2ft	ft is 310 - (b) M1 for 360 - (50 + (b)) oe	9
				104

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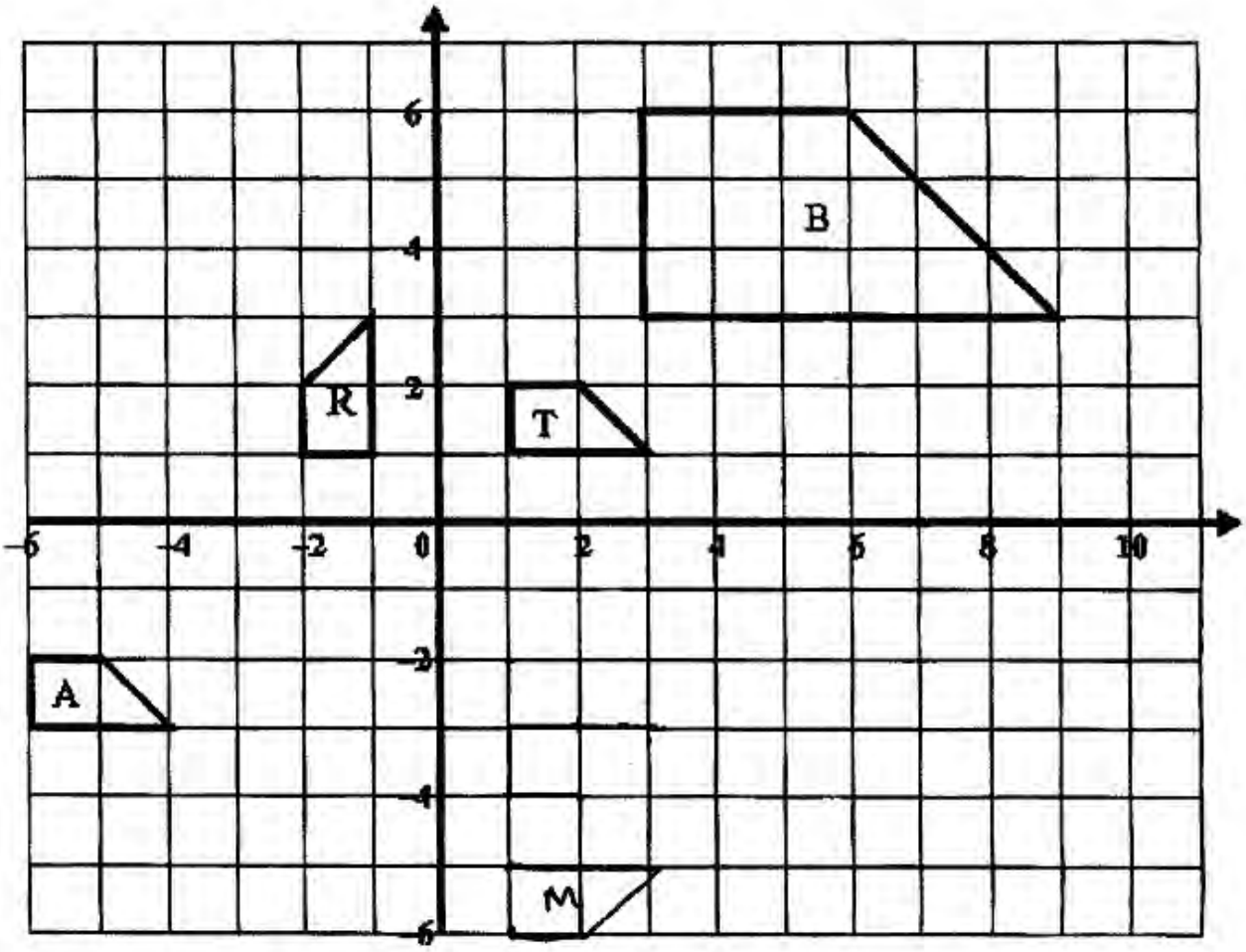
Diagram Solutions

Question 1



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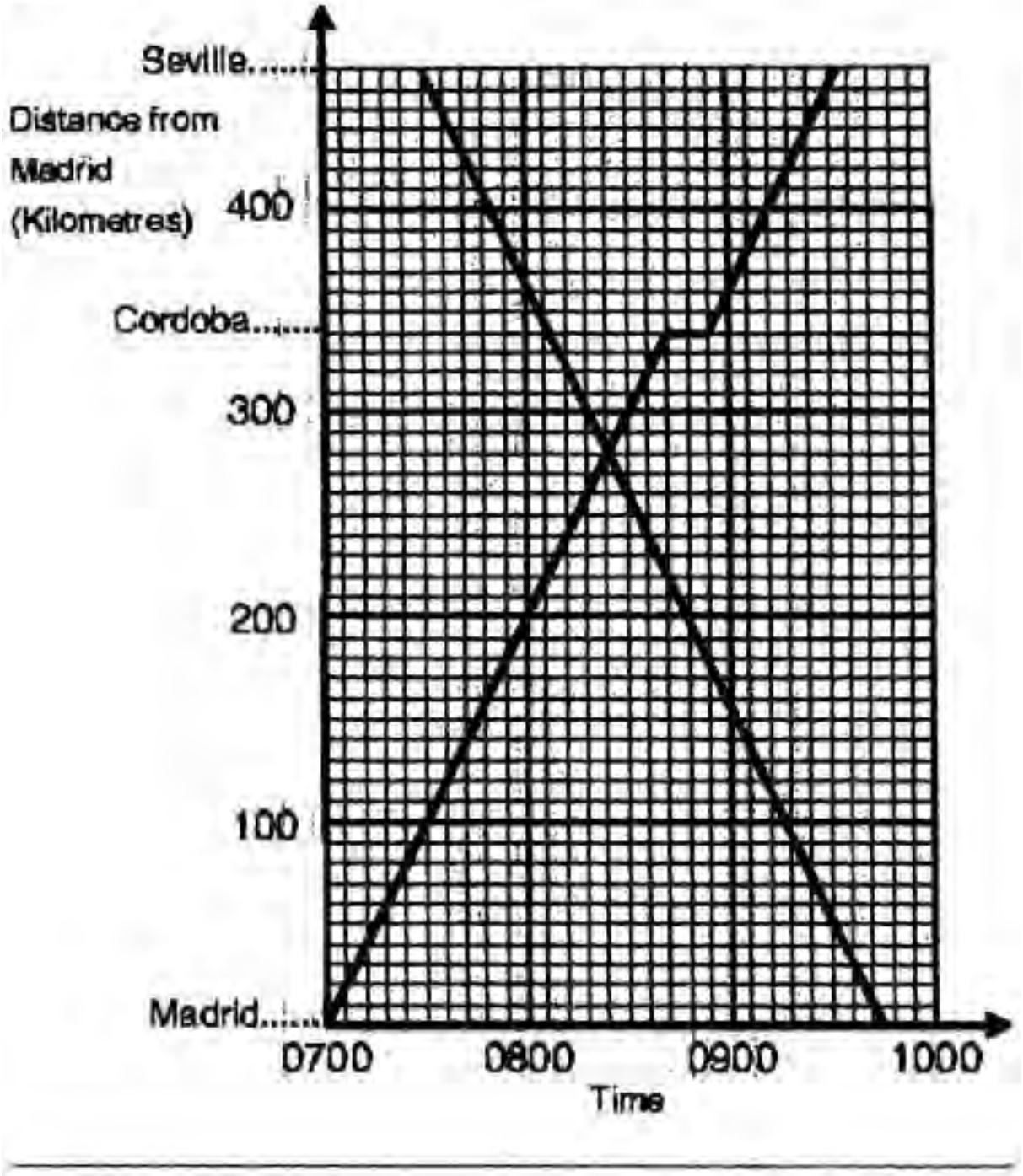
Question 5



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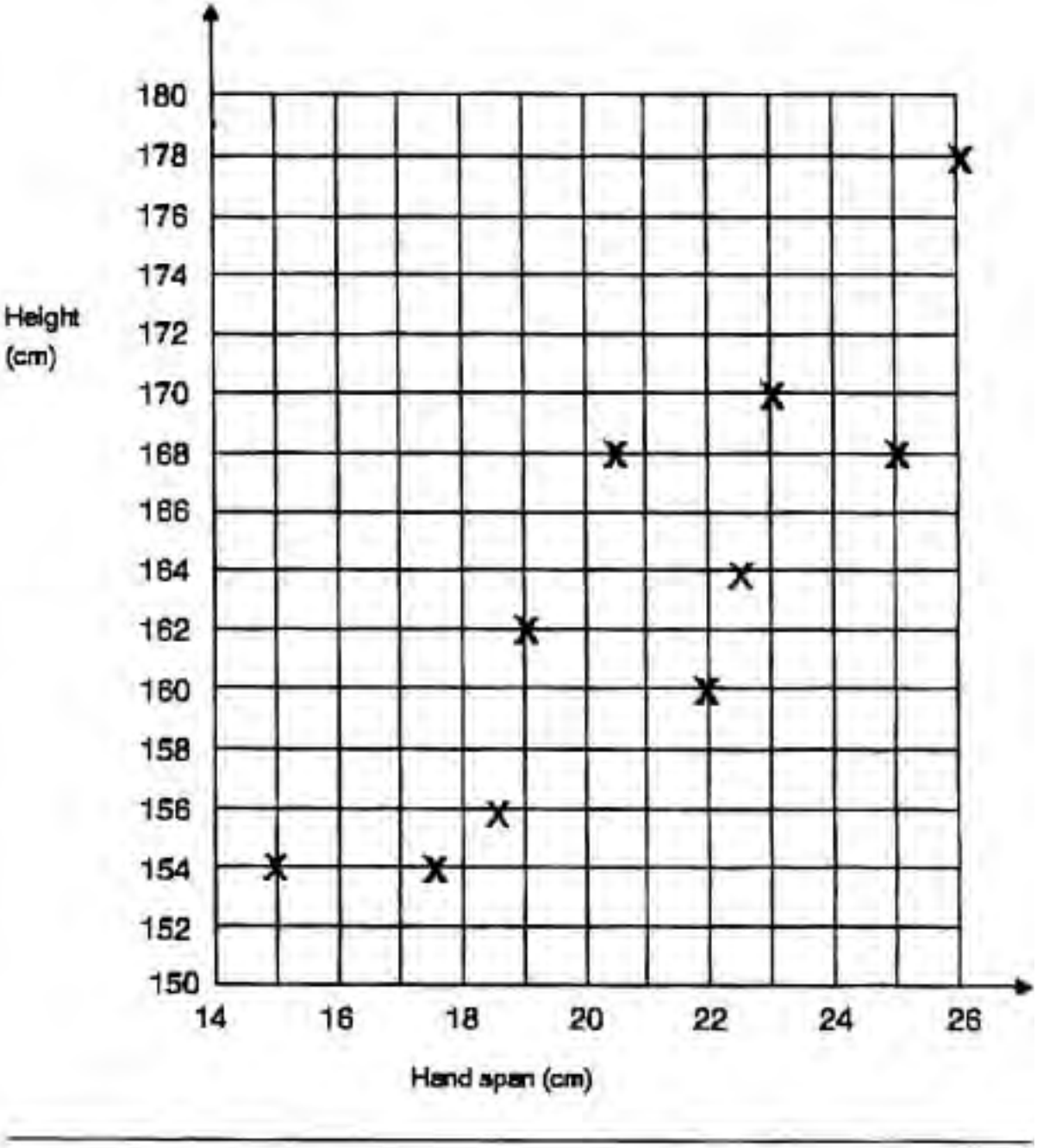

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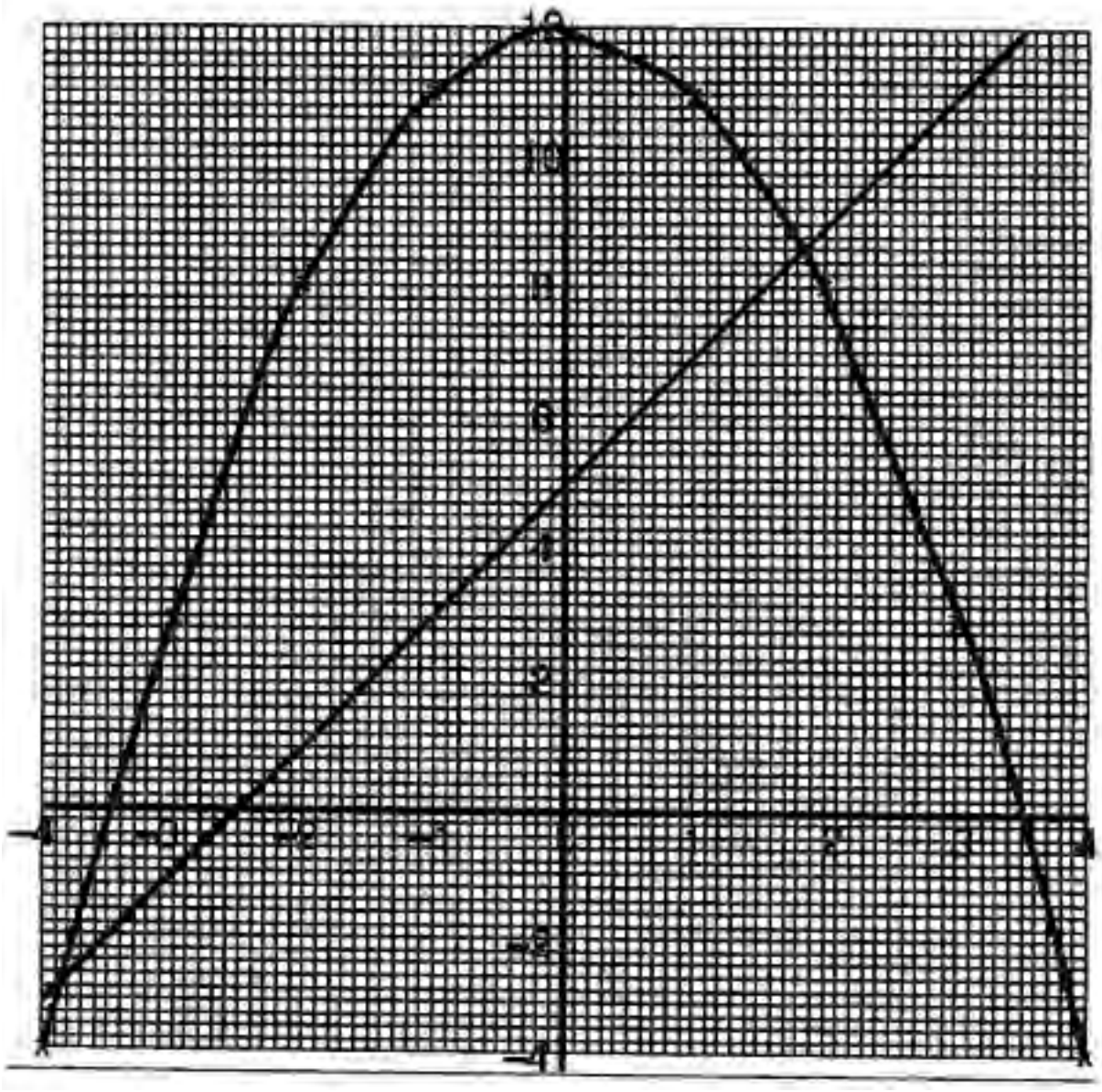
Question 7



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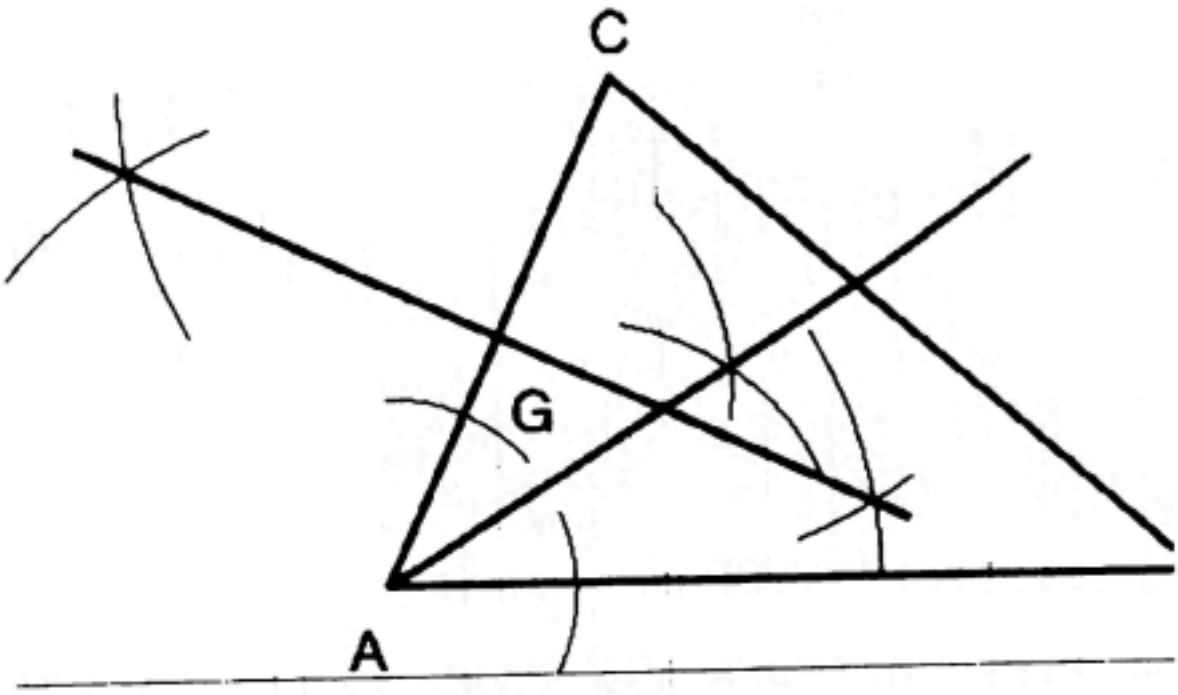
Question 9



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