EXAMINATION COUNCIL OF ESWATINI
Junior Certificate

Additional Mathematics **519**

2020

Confidential

MARK SCHEME

Additional Maths

{519}

MARKS: 100

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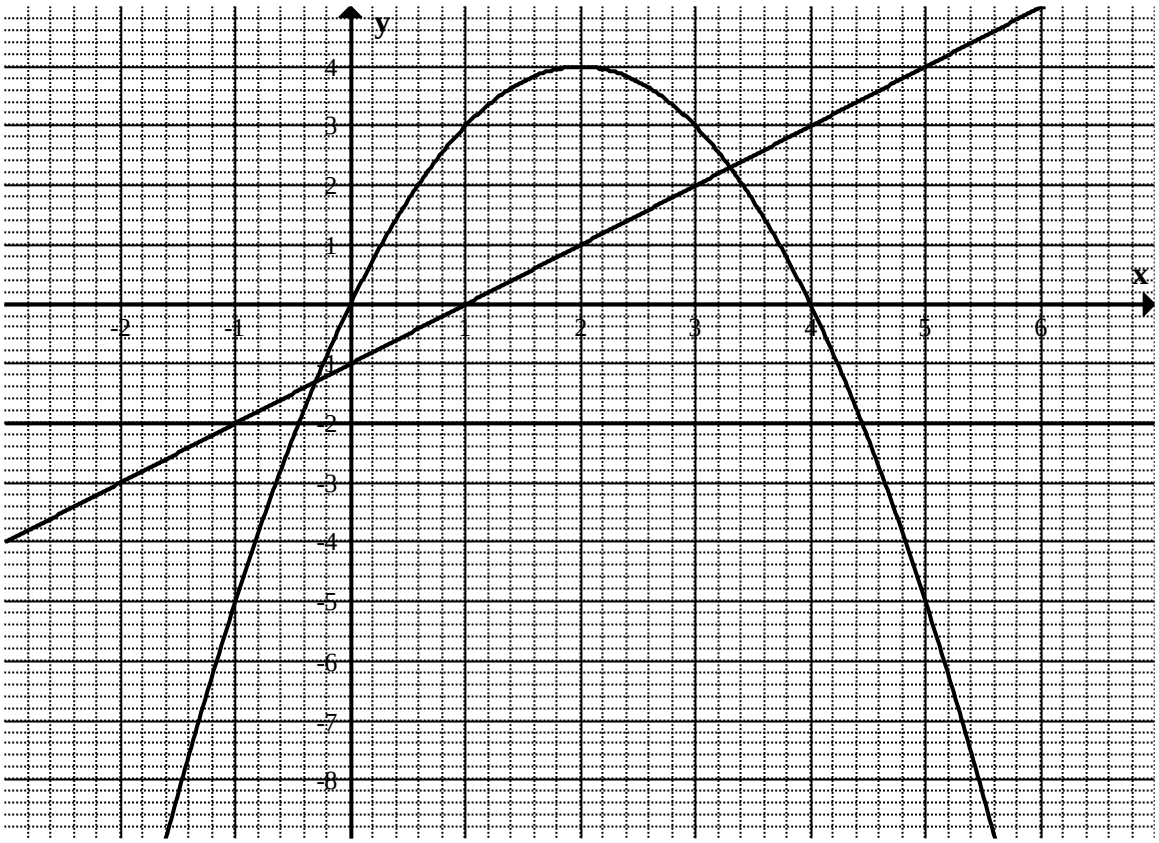
Question	Answers	Marks	Comments
1 (a) (i)	$\begin{pmatrix} 6 & 14 \\ -10 & 2 \end{pmatrix}$	B2	-1 for each wrong
(ii)	$\begin{pmatrix} 23 \end{pmatrix}$	B2	
(iii)	$\begin{pmatrix} 4 & -2 \\ 0 & -3 \end{pmatrix} - \begin{pmatrix} 9 & -3 \\ -15 & 0 \end{pmatrix}$	M1	For $\begin{pmatrix} 9 & -3 \\ -15 & 0 \end{pmatrix}$
	$\begin{pmatrix} -5 & 1 \\ 15 & -3 \end{pmatrix}$	A2	-1 for each wrong
(b)	a = -2	B1	
	3a – b = 10 b = -16	M1 A1	
		[10]	
2 (a)	$\frac{7x-7-3x-9}{(x+3)(x-1)}$	M2	M1 for $\frac{7(x-1)-3(x+3)}{(x+3)(x-1)}$
	$\frac{4x-16}{(x+3)(x-1)}$	A1	
(b) (i)	$(x + 2)(x – 6)$	B2	B1 for each factor
(ii)	$(p – 1)(p + 1)$	B2	A1 for each factor
(c)	$5(2 – x) – 12 = 15$	M1	For multiplying by the LCM
	$10 – 5x -12 = 15$	M1	Alternatively: $\frac{10-5x-12}{15} = 1$ M1
	$- 5x = 17$	M1	$-5x -2=15$ M1 (removing fraction)
	$x = -3\frac{2}{5}$	A1	$- 5x = 17$ M1 $x = -3\frac{2}{5}$ A1
		[11]	
3 (a) (i)	2**a**	B2	B1 for 9**a** – 5**a**
(ii)	3**b** + 2**a**	B2	
(iii)	-3**b** – 2**a** - 5**a** oe -7**a** – 3**b**	M1 A1	
(iv)	-5**a** + 3**b** – 2**a** oe -7**a** + 3**b**	M1 A1	

(b) (i)	$\sqrt{89}$ 9.43	M2 A1	M1 for $\sqrt{8^2+(-5)^2}$
(ii)	-5 = 2(3*x* -2) oe 6*x* = –1 $x = -\frac{1}{6}$	M1 M1 A1 **[14]**	
4 (a)	$\frac{6}{36}$ $\left(\frac{1}{6}\right)$	B2	
(b)	$\frac{15}{36}$ $\left(\frac{5}{12}\right)$	B2	
(c)	$\frac{4}{36}$ $\left(\frac{1}{9}\right)$	B2	
(d)	$\frac{2}{36}$ $\left(\frac{1}{18}\right)$	B2 **[8]**	
5 (a)	correct sketch	B2	
(b)	$\tan x = \frac{7}{15}$ oe 25.0°	M1 A2 **[5]**	
6 (a) (i)	$3m = \sqrt{n-8}$ $n - 8 = 9m^2$ $n = 9m^2 + 8$	M1 M1 A1	
(ii)	44	B2	B1 for $9(-2)^2+8$ (Substitution even from original eqation)
(b)	-3x > *x* – 7 oe - 4*x* > –7 oe $x < \frac{7}{4}$	M1 M1 A1	
(c) (i)	$\frac{4}{5}$ oe	B2	B1 for $\frac{8}{10}$
(ii)	$\frac{-1}{5}$ oe	B2	B1 for $\frac{-2}{10}$
(d) (i)	3x + 2y = 9 2x – 3y = 6	B1 B1	

(ii)	$x = 3,\ y = 0.$	ft B3 **[17]**	after B0 allow SC1 for correct substitution
7 (a)	$p = 4,\quad q = -5$	B2	B1, B1
(b)	see diagram. P2, C1	3	
(c)	$x = 2$	B1	
(d) (i)	$x =$ -0.3 to -0.5 or $x =$ 4.4 to 4.6	B2	B1, B1
(ii)	graph $y = x$-1 $x =$ -0.2 to -0.4 or $x =$ 3.2 to 3.4	L2 B2 **[12]**	B1, B1
8 (a)	Cos 25 = $\frac{10cm}{SR}$ oe $SR = \frac{10cm}{\cos 25}$ = 11.03cm	M1 M1 A1	
(b)	$h = 10 \times \sin 25$ = 4.23	M2 A1	
(c)	$\sqrt{18.1071}$ = 4.26	M2 A1	M1 for $\sqrt{6^2 - 4.23^2}$
(d)	$\sin QPR = \frac{4.23}{6}$ $QPR = 44.83^o$ PRQ = 180 − (25 + 44.83) = 110.2	M1 A2 A1 **[13]**	
9 (a)	37, 65, 83, 95, 100	B2	minus 1 for each wrong
(b)	100	ft B1	
(c)	63	B2	B1 for 28 + 18 + 12 + 5 seen
(d)	See diagram P2, C1	3	
(e)	58.4 to 58.6	B2 **[10]**	B1 for median position seen on diagram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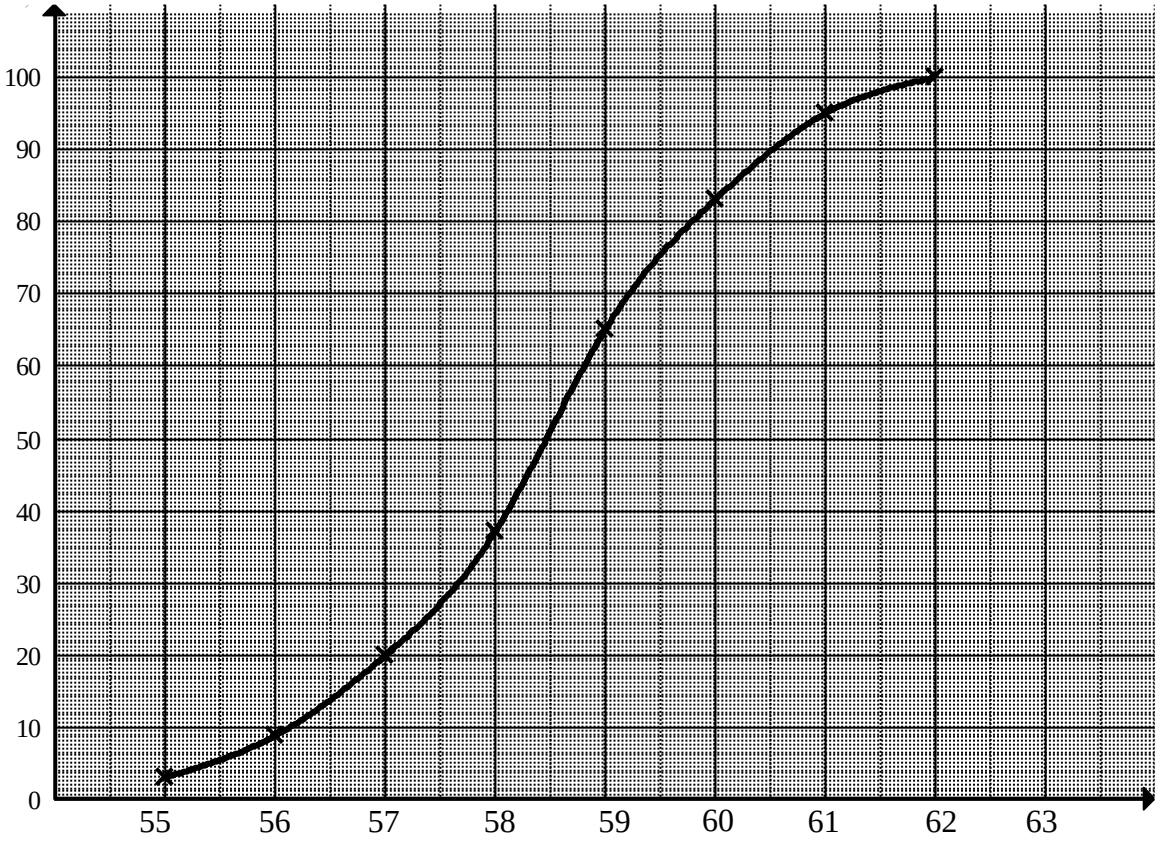
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