Revision F5 (All topics) B [45] MARKSCHEME

1.

(i)   70   B1

         (opposite angles of) cyclic quadrilateral   B1

(ii)   140   B1

                       f.t .their (i)

         angle at centre is twice angle at circumference   B1

                                                                             [4]

2.

$(3x \pm a)(x \pm b)$ $ab = \pm 2$ M1

$(3x - 2)(x + 1)$ A1

$(3x + 2)(3x - 2)$ B1

$\dfrac{x+1}{3x+2}$ A1

                       ft if Ml awarded, but only if a valid factor cancelled
                       Further work such as cancelling x's do not award last mark

                                                                             [4]

3.

(a)   Parallel curve translated up y axis   B1
                            '2' need not be marked, needs to look
                            symmetrical

(b)   Parallel curve translated in positive direction along x axis   B1
                            Must 'sit on' x axis and look
                            symmetrical

4.

$6c(c^2 + 5)$ or $3(c^2 + 5)$	M1	
$\dfrac{6c(c^2 + 5)}{3(c^2 + 5)}$	M1	This mark implies first M1
$2c$ and multiple of 2 so even	A1	oe statement Must see method

5.

(a)	$x, x + 1, x + 2, x + 3$	1	accept correct alternatives
	$x + (x + 1) + (x + 2) + (x + 3)$ or $4x + 6$	1	
	$2(x + 3)$	1	
		3 AO2.4b	
(b)	e.g. $1 + 2 + 3 + 4$	1	
	$4x + 6$ is not a multiple of 4	1	Allow e.g. $1 + 2 + 3 + 4 = 10$ is not a
		2 AO2.4a	multiple of 4

6.

(a) 9   B1

(b) Plot points   Bl ft

$$Tolerance \pm\frac{1}{2} \; square$$

Smooth curve   Bl ft

$$Tolerance \pm \; \pm\frac{1}{2} \; square$$

Must not cross **x** *axis*

(c) $(3x^2 - 2x + 1) - (3x^2 - 6x + 2)$ M1
     Accept $\pm 4x \pm 1$ *for M1*

     $= 4x - 1$

     Draw $y = 4x - 1$ Bl ft

     $x = 0.42, 1.58$ A1
     Accept 0.35 to 0.5, 1.5 to 1.65
     [inclusive]
     Delete 1 mark for co-ordinates

                                                                       [6]

7.

(a)		chain of reasoning	C1	for a relevant product eg $\dfrac{y}{y+5} \times \dfrac{5}{y+4}$
			C1	for a correct equation eg $2\times\left(\dfrac{y}{y+5}\times\dfrac{5}{y+4}\right)=\dfrac{6}{11}$
			C1	for method to eliminate fractions from algebraic expression
			C1	complete chain of reasoning
(b)		$\dfrac{3}{11}$	M1	method to solve equation eg $(ax + b)(cx +d)$ with $ac = 3$ and $bd = \pm 60$
			A1	for selecting $y = 6$
			A1	for $\dfrac{3}{11}$ oe

8.

$$27^{-\frac{2}{3}} = \frac{1}{27^{\frac{2}{3}}} \; or \; 3^{-2} \; or \; \frac{1}{3^2}$$ M1

$$\frac{1}{9}$$ A1

                                                                       [2]

9.

(a)	$8^{\frac{5}{15}} = 8^{\frac{1}{3}} = \sqrt[3]{8} = 2$	**2** 2 AO2.2	**M1** for $8^{\frac{5}{15}}$ or $8^{\frac{1}{3}}$
(b)	$3^{\frac{1}{2}}$	**3** 1 AO1.3b 1 AO2.2 1 AO3.1b	**B2** for $3^{\frac{4}{8}}$ or equivalent fractional power Or **M1** for 3^4 or $\left(3^3 \times 3\right)^{\frac{1}{8}}$ or $27^{\frac{1}{8}} \times 3^{\frac{1}{8}}$

10.

Multiply by $\dfrac{\sqrt{7}+2}{\sqrt{7}+2}$ [M1] soi

Denominator becomes 3   [B1]

Attempt to expand the numerator   [M1] at least 2 terms correct

$3\sqrt{7} + 6 + 4\sqrt{7}\sqrt{7} + 8\sqrt{7}$ oe

$\dfrac{34+11\sqrt{7}}{3}$ [A1 for 34, A1 for $11\sqrt{7}$]

11.

$x^2 + 6$ or $(x-3)^2$	M1	
$x^2 - 3x - 3x + 9$	M1	4 terms with 3 correct
$6x < 3$	M1dep	oe linear inequality dep on two quadratic expressions ft their quadratic expressions
$x < 0.5$	A1	oe