Test Yourself – Mark Scheme

Section	Question	Answer	Marks	Notes
TOPIC 1	1	x = ± 3	M2 M1 A1	Use of quadratic formula (M1) in x^2 (M1) $x^2 = 9$ cao
	2(i)	$4 (x – 3)^2 - 9$	B1 B1 M1A1	a = 4 b = 3 c = -9
	2(ii)	(3,-9)	B2	B1 for each coordinate
TOPIC 2	1	$t = [\pm]\sqrt{\frac{2s}{a}}$ o.e.	B3	B2 for t omitted M1 for constructive first step M1 for finding square root of their 't^2'
	2	$[x =]\frac{6y}{3+m}$ as final answer	M1 M1 A1	for 3x + mx = y + 5y oe for x(3 + m) or ft sign error
	3	$[x =]\frac{2y+3}{y-1}$ o.e. or ft	M1 M1 M1 M1	for multiplying by x-2 for expanding brackets for cllecting x and 'other' terms for factorising and dividing Award all four marks only if fuly correct
TOPIC 3	1	$x = \frac{7}{11}$ $y = \frac{24}{11}$ oe www	B3	B2 for one coordinate correct, or correct solution not erxpressed as coordinates (or) M1 for substitution or elimination of one variable oe
	2	a = 3 b = 32	M1 A1A1	Equating 5x – a and 2x + 18 and substituting x = 7
	3	x = -0.5 or 1 y = 4.25 or 2	M1 M1 A1 A1	for $7-3x = 2(x^2 – 2x + 3)$ oe for quadratic in x ($2x^2 – x – 1 = 0$ oe) x y
TOPIC 4	1(i)	$3\sqrt{6}$	M1 A1	for $\sqrt{4x6}$ oe seen
	1(ii)	$10 + 2\sqrt{7}$	M1 M1 A1	for attempt to multiply num and denom by $5 + \sqrt{7}$ for 18 or 25 – 7 seen
	2(i)	$28\sqrt{6}$	M1 A1	for $30\sqrt{6}$ or $2\sqrt{6}$ oe
	2(ii)	$49 - 12\sqrt{5}$	B2 B1	for 49 for $12\sqrt{5}$ If B0, award M1 for 3 correct terms of $4 - 6\sqrt{5} - 6\sqrt{5} + 45$

TOPIC 5	1(i)	9	M1 A1	for 3^2 oe
	1(ii)	8 (condone -8 or ±8)	M1 A1	for $16^{0.25} = 2$
	2(i)	$4x^4y$	M1 A1	for two elements correct
	2(ii)	32	M1 A1	for 2^5 oe
	3	$\frac{4}{27}$	B1 B1	numerator denominator
TOPIC 6	1	Grad of AB = -3 Grad of BC = $\frac{1}{3}$ product of gradients = -1	B1 B1	either gradient product of gradients need to equal -1
	2	(3,6)	B1	
	3	Coordinates (0,2) (0.5,0)	M1 M1 A1A1	for y = -4x + c for y = -4x + 14 one mark for each set of coordinates
	4	y = 3x - 7	M1 M1 A1	Gradient = 3 Subst in (4,5) into their 'y = mx + c'
TOPIC 7	1	Cubic the correct way up x-axis cuts at -1, 2, 4 shown y-axis cuts at 8 shown	G1 G1 G1	
	2	Sketch of cubic correct way up Curve through (0,0) Curve touches x-axis at x=3	G1 G1 G1	
	3	Correct graph with clear asymptote at x = 2 (0, -0.5) shown	G2 G1	(G1 for only one branch correct0
	4	10	B1	
TOPIC 8	1	$y = x^2 - 8x + 5$	B1	
	2	$f(x - 3) = (x - 3)^3 - 5(x - 3) + 2$ $(x^2 - 6x + 9)(x - 3)$ $f(x - 3) = x^3 - 3x^2 - 6x^2 + 18x + 9x - 27 - 5x + 15 + 2$ $= x^3 - 9x^2 + 22x - 10$	B1 B1 A1 B1	Substitution Partial expansion of cubic term All correct unsimplified Correct consolidation
	3	$f(x-4) = 2(x-4)^3 + 7(x-4)^2 - 7(x-4) - 12$ $2x^3 - 17x^2 + 33x$	M1 M1 M1	Substitution Correct expansion of one pair of brackets correct completion to given answer
	4	$(x + 1 - 3)(x - 2 - 3)(x - 4 - 3)$ ie $(x -2)(x - 5)(x - 7)$	M1 A1	Allow one slip Oe

TOPIC 9	1	Tan 42° = $\frac{opp}{adj}$ 0.9004 = $\frac{height\ of\ pole}{15}$ 13.5(06) m = height of pole	M1 M1 A1	
	2	$\pm\ \frac{\sqrt{13}}{4}$	B3	B2 for either - $\frac{\sqrt{13}}{4}$ or $\frac{\sqrt{13}}{4}$ or $\pm\frac{\sqrt{13}}{\sqrt{16}}$ oe or M1 for $\sqrt{13}$ seen
	3	(0, 0) (90, 1) (270, -1) (360, 0)	B1 B1 B1 B1	
TOPIC 10	1(i)	C = 141.1….. Bearing = 038. 8 (accept 038.9)	M1 M1 A1 A1	Correct attempt at cosine rule Correct full method for C C Bearing
	1(ii)	3030 to 3050 acceptable	M1 A1	Correct use of 0.5xaxbxsinC
	2	AB = 7.80 (or better, 7.799…) Area = 52.2 to 52.3	M1 A1 M1 A1	Correct use of sine rule AB 2 x 0.5 x 'their AB' x 11.4 x sin 36 Area