**The Bridge to A level**

**Test Yourself Mark Scheme**



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| Section | Question | Answer | Marks | Notes |
| 1 | 1 | x = ± 3 | M2  M1  A1 | Use of quadratic formula (M1)  in x2 (M1)  x2 = 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 |
|  |  |  |  |  |
| 2 | 1 |  | B3 | B2 for t omitted  M1 for constructive first step  M1 for finding square root of their ‘t2’ |
|  | 2 |  | M1  M1  A1 | for 3x + mx = y + 5y oe  for x(3 + m) or ft sign error |
|  | 3 |  | 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 |
|  |  |  |  |  |
| 3 | 1 | x = y = 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(x2 – 2x + 3) oe  for quadratic in x (2x2 – x – 1 = 0 oe)  x  y |
|  |  |  |  |  |
| 4 | 1(i) |  | M1  A1 | for oe seen |
|  | 1(ii) | 10 + | M1  M1  A1 | for attempt to multiply num and denom by 5 +  for 18 or 25 – 7 seen |
|  | 2(i) |  | M1  A1 | for or oe |
|  | 2(ii) | 49 - 12 | B2  B1 | for 49  for 12  If B0, award M1 for 3 correct terms of 4 - 6- 6 + 45 |
|  |  |  |  |  |
| 5 | 1(i) | 9 | M1  A1 | for 32 oe |
|  | 1(ii) | 8 (condone -8 or ±8) | M1  A1 | for 160.25 = 2 |
|  | 2(i) | 4x4y | M1  A1 | for two elements correct |
|  | 2(ii) | 32 | M1  A1 | for 25 oe |
|  | 3 |  | B1  B1 | numerator  denominator |
|  |  |  |  |  |
| 6 | 1 | Grad of AB = -3  Grad of BC =  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’ |
|  |  |  |  |  |
| 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 |  |
|  |  |  |  |  |
| 8 | 1 | y = x2 – 8x + 5 | B1 |  |
|  | 2 | f(x – 3) = (x – 3)3 –5(x – 3) + 2  (x2 – 6x + 9)(x – 3)  f(x – 3) = x3 – 3x2 – 6x2 + 18x + 9x – 27 – 5x + 15 + 2  = x3 – 9x2 + 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  2x3 – 17x2 + 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 |
|  |  |  |  |  |

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| 9 | 1 | Tan 42° =  0.9004 =  13.5(06) m = height of pole | M1  M1  A1 |  |
|  | 2 | ± | B3 | B2 for either - or or ± oe  or M1 for seen |
|  | 3 | (0, 0)  ( 90, 1)  (270, -1)  (360, 0) | B1  B1  B1  B1 |  |
|  |  |  |  |  |
| 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 |
|  |  |  |  |  |
| 11 | 1 | Critical values x = 6 and x = -3 | M1  M1  A1 | Factorise  Solve for x  Deduce correct range |
|  | 2 | (x-4)(x+1) >0  Critical values x = 4 and x = -1  x < 4 and x > 1 | M1  M1  A1 | Factorise  Solve for x  Deduce correct range |
|  | 3 | (x+6)(x-5) < 0  -6 < x < 5  x positive integer 0<x<5 | M1  M1  M1  A1 | Construct equation  Factorise  Deduce correct range  Correct interpretation of values |
|  |  |  |  |  |
| 12 | 1a | 2n = multiple of 2 = even therefore 2n+1 must be odd | A1 |  |
|  | 1b | = 4mn + 2n + 2m + 1  = 2 ( 2mn + n + m) + 1  2 ( 2mn + n + m) must be even  2 (2mn + n + m) + 1 must be odd because the bracket is even. | M1  M1  M1  A1 | Expand and simplify brackets  Factorise  Explain why bracket is even  Deduce result must be odd |
|  | 2a | n + (n+1) + (n+2) + (n+3) = 4n+6  =2(2n+3)  which is a multiple of 2 and therefore even  One example of many = 12+13+14+15 = 54 which is even though not divisible by 4  (2) | M1  M1  A1 | Represent numbers algebraically  Factorise  Conclusion with reason |
|  | 2b | 12+13+14+15 = 54  which is even though not divisible by 4 | M1  A1 | Example  Justification |
|  |  |  |  |  |
| 13 | 1a) |  | M1  A1  M1  A1 | Find CB  Find CN  Find MN  Given in simplest form |
|  | 1b) |  | A1 | Justification relating to parallel vectors being a multiple of one another |
|  | 2a | BC = -4b + 8a or 4(2a – b) oe | B1 |  |
|  | 2b | AQ = -4a + 4b + (-4b + 8a)  AQ = - a + b or (4b – 2a) oe | M1  A1 |  |
|  | 3 |  | M1  A1 | Vector from diagram  Use of pythagoras |
|  |  |  |  |  |
| 14 | 1 | TVV x x =  VTV x x =  VVT x x =  VVV x x =  P(more vegetable) = | M1  M1  M1  A1 | Correct outcomes chosen  Multiplying each probability  Adding their probabilities  Correct solution |
|  | 2a | 25, 10, 13, 2 | M1  A1 | At least 2 correct  All correct |
|  | 2bi | 25+13  19/25 oe | M1  A1 | Addition of “their 25 and 13” seen |
|  | Ii | 13+2  13/15 oe | M1  A1 | Addition of “their 2 and 13” seen |
|  |  |  |  |  |
| 15 | 1a | 50 x 0.7 = (35)  30 x 2.167 = (65) | M1  A1 | M1 for at least one calculation  A1 both correct |
|  | 1b | (181 + 1)/2 = 91  First three bars = 80, need 11 more for median.  11 / 2.2 = 5  70 + 5 = 75 cms | M1  M1  A1 | Calculation for where median will lie |
|  | 2a | 21, 36 and 51 indicated with box  0 and 103 indicated  Correct plot | M1  M1  A1 |  |
|  | b | 1 comment each regarding  Median  IQR | A1  A1 | Median has incresed showing (statement)  IQR has increased showing (statement) |
|  |  |  |  |  |