**Marking Scheme – Higher Unit Assessment 1**

Points of process and accuracy are marked • in the table

Points of reasoning are marked # in the table.

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| Question | Points of expected responses | Illustrative scheme |
| 1  A1.1 | •1  interprets gradient | •1 m = - 5/2 |
| •2  obtains equation | •2 y –(-4) = - 5/2 ( x – 3)  NB can be left in this form |
| Note:  No marks should be deducted as a result of an error subsequent to •2 being awarded. | | |
| 2  A1.1 | •1 interprets perpendicular | •1 m perp = 3/4 |
| •2  substitutes correctly | •2 y – 6= 3/4 ( x + 2 ) |
| Note:  No marks should be deducted as a result of an error subsequent to •2 being awarded. | | |
| 3  A1.1  #2.2 | •1 finds acute angle | •1 tan-1 (5) = 78.69˚ |
| #2.1 uses correct strategy | #2.1 evidence of and attempting to find obtuse angle |
| •2 finds obtuse angle | •2 180° – 78.69° = 101.31° (rounding not required) |
| 4  A1.1  #2.2 | •1  uses | •1  (stated or implied by #2.2) |
| #2.2 interprets correct angle and correct explanation | #2.2 Extreme skiing, m = 3.73 > 3 |
| Note:  tan 105° also gets •1 as does −tan 105°. | | |
| 5  A1.2 | •1 interprets congruent | •1 *r* = 10 units, C( -10,0) |
| •2 interprets centre | •2 ( x + 10 )² + ( y – 0 )² = …… |
| •3 interprets radius and complete equation | •3 ( x + 10 )² + ( y)² = 100 |
| Note: •2 is not awarded for 102, this must be simplified to 100. | | |
| 6  A1.2  #2.2 | •1 set up intersection equation | •1 ( x +4 )² + (x – 1 - 3)² = 49 |
| •2 simplifies | •2 2x² +2x – 24 = 0 |
| •3 solves | •3 2 ( x – 3)(x + 4) = 0, x = 3, - 4 |
| #2.2 interprets solution | #2.2 two points of contact implies line is not a tangent to the curve (alternatively, use discriminant) |
| Note:  An “= 0” must appear somewhere in the working between •1and •3. Failure to appear will lose one mark. | | |
| 7  A1.3 | •1 interprets information | •1 u1 = au0+b, 11= 5a + b  u2 = au1 + b, 29 = 11a + b |
| •2 solves to find *m* and *c* | •2 a = 3 and b = -4 |
| •3 correct recurrence relation | •3 un+1 = 3un - 4 |
| •4 correctly finds | •4 u3 = 3(29) - 4 = 83 |
| Note:  Award •4 for 83 by calculator. | | |
| 8 (a) | •1 state recurrence relation | •1 un+1 = 0.927un + 20 |
| 8 (b)  A1.3  #2.2 | •2 knows how to find limit | •2 L = 0.927 L + 20 or L = |
| •3 process limit | •L = 273.97 |
| #2.2 compare and state conclusion | #2.2 In the long term the stock will be level out at 273.97 from the initial 200. |
| Note:  The only answer that should be awarded •1 is given above. This would include the fractional equivalent of 0·927 | | |

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| **Question** | **Points of expected responses** | **Illustrative scheme** |
| 9  (a)  (b)  (c) | •1 strategy to start process of factorisation for cubic, eg synthetic division or other method  •2 showing *R* = 0 and clear communication of corresponding factor or root  •3 first linear factor  •4 extract quadratic factor  •5 complete cubic factorisation  •6 solves | •1  or  *a* 2 −15 16 12  *b*    •2 6 2 −15 16 12  12 -18 -12  2 -3 -2 0 ∴ (*x* –6) is a factor (or *x* = 6 is a root), OR    f(6) = 0 => x = 6 is a root ( x – 6) is a factor    •3 (*x* – 6)(…………) or (*x* -2 )(………..)  •4  2x² -3x -2 or consistent with mark 2  **•5** ( x – 2) ( 2x - 1 ) (x -6 )  •6 x = 2 , x = 0.5 , x= 6 |
| Notes  •1 awarded for selecting a value and following through ― need not be a correct value, but must be a factor of 12  •2 candidates must show some acknowledgement of the resulting zero  •5 is for the product of the correct three linear factors in any order | | |
| 10 | #2.2 communicates solution from the context | #2.2 evidence of correctly communicating the context by providing the correct solution  f(x) = ( x+2)( x - 5) ( x – 3)  , , x = 5 |
| 11 | #2.1 knows to use discriminant and substitutes correctly  •1 substitutes correctly  •2  applies correctly | #2.1  Evidence of knowledge of discriminant ie  b² - 4ac = (-9)² - 4 x k x -5  •1 81+20k<0  •2 k < -4.05 |
| 1.  Total of 29 marks plus 2 x #2.1 and 3 x #2.2 | | |

## Judging evidence

The following table describes how the Assessment Standards may be met. Different assessment approaches may be expected to generate different types of evidence, but the same Assessment Standards will apply.

The final column provides commentary on the evidence that may be generated using the assessment for candidates (Appendix 1).

Assessors should ensure that candidates are assessed only on whether they have met the Assessment Standards and not the quality of, for example, their writing, drawing, presentation, planning or ICT skills, unless these are required by the Assessment Standards.

In this assessment package all of the sub-skills are assessed. The fourth column in the following tables illustrates this.

When making any assessment judgement, assessors should allow for minor rounding errors if these do not affect the demonstration of the mathematical skill being assessed.

SQA have exemplified two methods for meeting the Assessment Standards in Outcome 1 namely:

**Method A**

For **Outcome 1**: each Assessment Standard will be met when the candidate has successfully demonstrated **more than half** the points of process and accuracy across the entire Assessment Standard.

**Method B**

For **Outcome 1**: each Assessment Standard will be met when the candidate has successfully demonstrated competence in **more than half the sub-skills** for the Assessment Standard.

Competence in a sub-skill is demonstrated when **more than half of the points** of process and accuracy are correct.

It is entirely up to the centre which method they choose for assessing each Assessment Standard for Outcome 1.

For **Outcome 2:** Assessment Standards 2.1 and 2.2 are transferable across Units. For candidates undertaking a standalone Unit, Assessment Standards 2.1 and 2.2 should be achieved on **at least one** occasion each.

For candidates undertaking the Course, Assessment Standards 2.1 and 2.2 should be achieved on **at least two** occasions from across the Course.

**Higher Maths - Unit 1 Assessment Marking Grid**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Questions** | **Assessment Standards** | | | | | |
| **A1.1** | **A1.2** | **A1.3** | **R+C 1.1** | **#2.1**  **achieved**  **(√/x)** | **#2.2**  **Achieved**  **(√/x)** |
| **1** | **/2** |  |  |  |  |  |
| **2** | **/2** |  |  |  |  |  |
| **3** | **/2** |  |  |  |  |  |
| **4** | **/1** |  |  |  |  |  |
| **5** |  | **/3** |  |  |  |  |
| **6** |  | **/3** |  |  |  |  |
| **7** |  |  | **/4** |  |  |  |
| **8a** |  |  | **/3** |  |  |  |
| **9a** |  |  |  | **/6** |  |  |
| **10** |  |  |  |  |  |  |
| **11** |  |  |  | **/2** |  |  |
| **Threshold** | **4/7** | **4/6** | **4/7** | **5/8** | **Achieved twice throughout course** | **Achieved twice throughout course** |
| **TOTAL** |  |  |  |  |  |  |
| **PASS/FAIL** |  |  |  |  |  |  |
| **Re-Sit P/F** |  |  |  |  |  |  |