**MATHEMATICS METHODS**

**MAWA Semester 1 (Unit 1) Examination 2015**

**Calculator-free**

# Marking Key

**Section One: Calculator-free (60 Marks)**

**Question 1(a)**

|  |  |
| --- | --- |
| Solution  |  |
| Marking key/mathematical behaviours | Marks |
| * Determines
 | 1 |

**Question 1(b)**

|  |
| --- |
| Solution by using the right triangle identity or  by knowledge of exact valuesSimilarly  |
| Marking key/mathematical behaviours | Marks |
| * indicates use of or uses meaningfully
* states correct exact value of  (accept )
* indicates use of
* states correct exact value of  (accept )
 | 1111 |

**Question 1(c)**

|  |
| --- |
| SolutionFrom exact values and use of unit circle,  |
| Marking key/mathematical behaviours | Marks |
| * indicates method of determination on diagram
* states both correct values of
 | 11 |

**Question 2(a)**

|  |
| --- |
| Solution |
| Marking key/mathematical behaviours | Marks |
| * multiplies the equation by the LCD
* expands brackets and simplifies
* solves for x
 | 111 |

**Question 2(b)**

|  |
| --- |
| Solution |
| Marking key/mathematical behaviours | Marks |
| * factorises trinomial
* solves for x
 | 11 |

**Question 2(c)**

|  |
| --- |
| Solution |
| Marking key/mathematical behaviours | Marks |
| * completes the square
* equates
* takes square root
* solves for x
 | 1111 |

**Question 3**

|  |
| --- |
| Solution  |
| Marking key/mathematical behaviours | Marks |
| * sketches  accurately, showing x and y intercepts
* sketches reflecting the correct turning point, orientation and intercepts
* sketches  with correct radius and centre
 | 1+11+1+12 |

**Question 4**

|  |
| --- |
| SolutionGraph A:  Graph B:   |
| Marking key/mathematical behaviours | Marks |
| * Graph A
	+ correct horizontal translation
	+ recognition of reflection in
* Graph B
	+ correct horizontal translation
	+ correct dilation factor
	+ recognition of reflection in
 | 11111 |
|  |  |

**Question 5(a)**

|  |
| --- |
| Solution1.
2. From part (i), *P*(*X*) = 0.7 and *P(Y*)= 0.5

 *P(X)*  *P(Y)* = 0.35  0.3 Therefore not equal |
| Marking key/mathematical behaviours | Marks |
| (i)* determines
* determines correct value for

(ii) * determines
* shows that
 | 111**2** |

**Question 5(b)**

|  |
| --- |
|  Solution  |
| Marking key/mathematical behaviours | Marks |
| (i)* applies the conditional probability formula
* substitutes correctly
* multiplies correctly and simplifies
* determines correct value for

(ii) * determines
* applies complimentary property and arrives at the correct result
 | 111111 |

**Question 6(a)**

|  |
| --- |
| Solution Has the form Period =  hence  =  Vertical translation 1 unit up, hence  = 1.Dilation parallel to *y* axis, scale factor = 3. Hence, *a* = 3 |
| Marking key/mathematical behaviours | Marks |
| * determines the period and hence
* identifies vertical translation and determines  = 1
* determines
* states the correct equation
 | 1111 |

**Question 6(b)**

|  |
| --- |
| Solution  |
| Marking key/mathematical behaviours | Marks |
| * graph is drawn over the correct domain
* graph is a cosine curve with the correct amplitude
* graph has the correct period
* phase shift is correct
* graph is accurate passing through (0,-3) and has smooth turning points
 | 11111 |

**Question 7 (a)**

** one mark denominator one mark numerator of answer**

**Question 7(b)**

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**one mark for two products, one mark denominator one mark numerator of answer**

**Question 7(c)**

****

**one mark for two products, one mark denominator one mark numerator for answer**

**Question 7(d)**

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**2 marks for denominator, one mark for numerator, one mark for final answer**

|  |  |
| --- | --- |
| Marking key/mathematical behaviours | Marks |
| (i)* states correct sample space

(ii)* determines that there are 6 pairs of numbers (listing or logic) that have an even product and determines the correct probability of an even product

(iii)* indicates that the only way that the product can be prime is if one of the cards has a one on it.
* determines the correct probability of a prime product

(iv)* provides some form of exhaustive listing of the sum of two numbers
* determines that there are only 4 possibilities of prime sums
* determines the correct probability of the sum being prime
 | 11+111111 |