Mathematics for Software Development

BSc (Hons) Computer Games Programming

School of Engineering, Arts, Science and Technology

Answer all of the following questions, showing all of your working. Use extra sheets of paper if required (graph or squared paper may be used).

Hand out on Monday 7th October 2019

**To be completed by 09:00 Monday 14th October 2019**

Student ID …………………………………..

This problem set has 8 questions, for a total of 100 points.

**ASSESSMENT**

The majority of the summative assessment takes the form of regular problem sets assigned to students to be completed within a reasonable time frame, formative feedback will be available to them during tutorial sessions and workshops.

These problem sets will reinforce topics discussed in lectures and lead into a final exam of three hours, requiring students to answer a series of questions and provide their workings to demonstrate their understanding of the concepts underlying the questions being asked of them.

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| --- | --- | --- | --- | --- |
| **Component Number** | **Form of assessment** | **Assessment size** | **Weighting (%)** | **Learning Outcomes assessed** |
| 1 | Problem Sets | 8 sets | 80% | 1, 2, 3 |
| 2 | Exam | 3 hours | 20% | 1, 2, 3 |

**ASSESSMENT CRITERIA**

1. Attempted to solve mathematical problems, making use of the correct underlying theories.
2. Submitted a series of solutions to assigned problem sets.
3. Produced solutions to problems, explaining their workings for each problem clearly and concisely.

Marks Awarded:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Question** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **Total** |
| **Marks Available** | **10** | **10** | **10** | **10** | **10** | **15** | **15** | **20** | **100** |
| **Score** |  |  |  |  |  |  |  |  |  |

Question 1

State the value of the following to 3 decimal places, answer in the space provided. [1 point each part]

1. sin 38o

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| --- | --- |
|  |  |

1. sin 138o

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| --- | --- |
|  |  |

1. sin 238o

|  |  |
| --- | --- |
|  |  |

1. cos 38o

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| --- | --- |
|  |  |

1. cos 138o

|  |  |
| --- | --- |
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1. cos 238o

|  |  |
| --- | --- |
|  |  |

1. tan 38o

|  |  |
| --- | --- |
|  |  |

1. tan 138o

|  |  |
| --- | --- |
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1. tan 238o

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| --- | --- |
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1. tan 338o

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Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 2

State the value of the following to 3 decimal places, answer in the space provided. [1 point each part]

1. sin 1 rad

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|  |  |

1. sin 3 rad

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|  |  |

1. sin 6 rad

|  |  |
| --- | --- |
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1. cos 1 rad

|  |  |
| --- | --- |
|  |  |

1. cos 3 rad

|  |  |
| --- | --- |
|  |  |

1. cos 6 rad

|  |  |
| --- | --- |
|  |  |

1. tan 1 rad

|  |  |
| --- | --- |
|  |  |

1. tan 3 rad

|  |  |
| --- | --- |
|  |  |

1. tan 6 rad

|  |  |
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1. tan 5.1 rad

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Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 3

Answer each of the following by indicating whether the statements are True or False. [1 point each part]

1. True/False
2. True/False
3. True/False
4. True/False
5. True/False
6. True/False
7. True/False
8. has no solution True/False
9. has only one solution True/False
10. has many solutions True/False

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 4

Convert the following radian measurements into degrees. [2 points each part]



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| Answer |  |



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| Answer |  |



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| Answer |  |



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| Answer |  |



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| Answer |  |

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 5

Convert the following degree measurements into radians. You may leave π in your answer or write as a decimal. [2 points each part]



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| Answer |  |



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| Answer |  |



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| Answer |  |



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| Answer |  |



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| Answer |  |

Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 10.

Question 6

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| --- | --- |
| Calculate the size of angles α and β for the following triangles: [5 points each part]  Give your answer to one decimal place. |  |

1. Hypotenuse = 13, Opposite = 9

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| Answer |  |
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1. Hypotenuse = 41, Adjacent = 17

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| Answer |  |
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1. Adjacent = 12, Opposite = 5

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| Answer |  |
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Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 15.

Question 7

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| --- | --- |
| Calculate the size of the missing sides for the following triangles: [5 points each part]  Give your answer to one decimal place. |  |

1. Hypotenuse = 13, α = 72o

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| Answer |  |
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1. Adjacent = 17, α = 35o

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| Answer |  |
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1. Opposite = 10, α = 68o

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| Answer |  |
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Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 15.

Question 8

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| If in triangle ABC the angle A is 36o, side b is 11 and side c is 9, calculate side a and the angles B and C. [20 points] |  | |
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Points awarded: \_\_\_\_\_\_\_\_\_ out of a possible 20.