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|  | Student Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Eastern Goldfields College**  Mathematics Specialist Year 11 2018  Assignment Validation – Calculator Free |
| Reading Time: 1 minute  Working Time: 15 minutes | Total Marks: 15 marks |

Question 1 (7 marks)

(a) A body moves from to .

(i) Determine the displacement vector in component form. (1 mark)

(ii) Determine the magnitude of the vector . (1 mark)

(b) A force of N acts on a body. Determine the magnitude of the force and the angle its direction makes with the positive -axis. (2 marks)

(c) A body moves with a velocity of 20 ms-1 at an angle of 120° with the positive -axis. Express the velocity of the body in the form , where and are constants.

(3 marks)

Question 2 (8 marks)

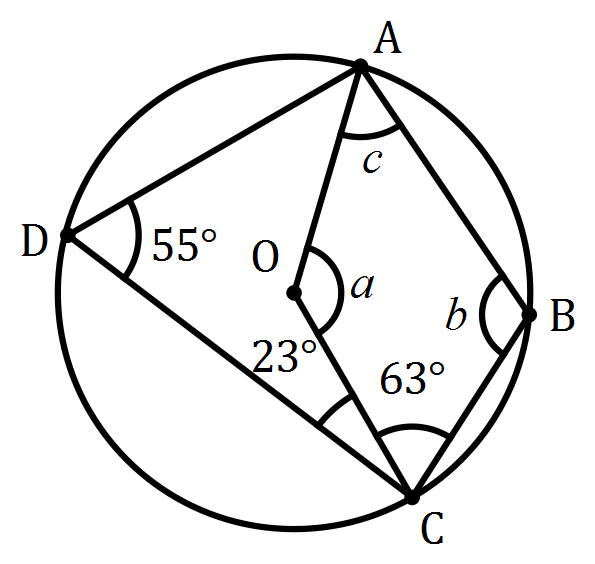
(a) Determine the number of different three-letter passwords that can be made by arranging a selection of three letters chosen from the list P, Q, R, R, R and S. (4 marks)

(b) Determine the number of positive integers between 1 and 240 inclusive that are divisible by at least one of the integers 4, 5 or 6. (4 marks)

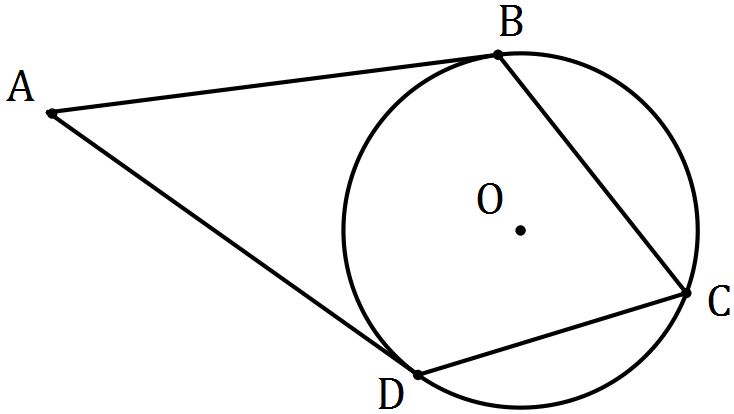
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|  | Student Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Eastern Goldfields College**  Mathematics Specialist Year 11 2018  Assignment Validation – Calculator Assumed |
| Reading Time: 1 minute  Working Time: 16 minutes | Total Marks: 16 marks |

Question 3 (8 marks)

(a) In the diagram, , , and lie on the circumference of circle with centre . Given that , and determine the values of , and . (3 marks)



(b) In the diagram below, points , and lie on the circumference of circle centre and and are tangents to the circle.



(i) Prove that is a cyclic quadrilateral. (3 marks)

(ii) Determine the size of if the size of . (2 marks)

Question 4 (8 marks)

Three vectors are given by , and , where is a constant.

(a) Determine the vector projection of on . (3 marks)

(b) Determine the value(s) of if

(i) and are perpendicular. (2 marks)

(ii) the angle between the directions of and is 45°. (3 marks)