**IB SL Review Trigonometry**

***NO Calculator Questions 1-5***

**1.** A triangle has sides of length 4, 5, 7 units. Find, to the nearest tenth of a degree, the size of the largest angle.

(Total 4 marks)

**2.** *O* is the centre of the circle which has a radius of 5.4 cm.



The area of the shaded sector *OAB* is 21.6 cm2. Find the length of the minor arc *AB*.

(Total 4 marks)

**3.** The circle shown has centre *O* and radius 6.  is the vector ,  is the vector  and  is the vector .



(a) Verify that *A*, *B* and *C* lie on the circle.

(3)

(b) Find the vector .

(2)

(c) Using an appropriate scalar product, or otherwise, find the cosine of angle .

(3)

(d) Find the area of triangle *ABC*, giving your answer in the form *a*, where *a*  .

(4)

(Total 12 marks)

**4.** Solve the equation 3 sin2 *x* = cos2 *x*, for 0°  *x*  180°.

(Total 4 marks)

**5.** If A is an obtuse angle in a triangle and sin A = , calculate the exact value of sin 2A.

(Total 4 marks)

**6. In this question you should note that radians are used throughout.**

(a) (i) Sketch the graph of *y* = *x*2cos *x,* for 0  *x* 2making clear the approximate positions of the positive *x*-intercept, the maximum point and the end-points.

(ii) Write down the **approximate** coordinates of the positive *x*-intercept, the maximum point and the end-points.

(7)

(b) Find the **exact value** of the positive *x*-intercept for 0  *x * 2*.*

(2)

Let R be the region in the first quadrant enclosed by the graph and the *x*-axis.

(c) (i) Shade *R* on your diagram.

(ii) Write down an integral which represents the area of *R.*

(3)

(d) Evaluate the integral in part (c)(ii), either by using a graphic display calculator, or by using the following information.

(*x*2 sin *x* + 2*x* cos *x* – 2 sin *x*) = *x*2 cos *x*. **(3)**

(Total 15 marks)

**7.** Find all solutions of the equation cos 3*x* = cos (0.5*x*), for 0  *x*  .

(Total 6 marks)

**8.** Consider the function *f* (*x*) = cos *x* + sin *x.*

(a) (i) Show that *f* (–) = 0.

(ii) Find in terms of , the smallest **positive** value of *x* which satisfies *f* (*x*) = 0.

(3)

The diagram shows the graph of *y* = e*x* (cos *x* + sin *x*), – 2  *x*  3. The graph has a maximum turning point at C(*a*, *b*) and a point of inflexion at D.



(b) Find .

(3)

(c) Find the **exact** value of *a* and of *b*.

(4)

(d) Show that at D, *y* = .

(5)

(e) Find the area of the shaded region.

(2)

(Total 17 marks)