# Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# **Topic 3 Review**

1. The following diagram shows a circular play area for children.

The circle has centre O and a radius of 20 m, and the points A, B, C and D lie on the circle. Angle AOB is 1.5 radians. Angle BOC is 2.4 radians.

1. Find the length of arc ADC. **[3]**
2. Find the length of the chord [AB]. **[3]**
3. Find the area of triangle AOB. **[2]**
4. Find the area of the shaded region. **[3]**
5. The shaded region is to be painted red. Red paint is sold in cans which cost  each. One can covers . How much does it cost to buy the paint? **[4]**
6. Let  and  .
7. Find  . **[2]**
8. Find  . **[2]**
9. Given that  can be written as  , find the value of *k*,  . **[3]**
10. Let  . Show that  can be expressed as  . **[2]**
11. The diagram below shows part of the graph of  , where  .



The point  is a maximum point and the point  is a minimum point.

1. Find the value of *a* . **[2]**
2. (i) Show that the period of *f* is  .

(ii) Hence, find the value of *b* . **[4]**

1. Given that  , write down the value of *c* . **[1]**
2. Let  ,  . Let  .
3. Find an expression for  . **[3]**
4. Write down the period of  . **[1]**
5. Write down the range of  . **[2]**
6. a. Show that  . **[2]**

b. **Hence**, solve the equation  for  . **[5]**

 **7.** The following diagram represents a large Ferris wheel at an amusement park.

The points P, Q and R represent different positions of a seat on the wheel.

The wheel has a radius of 50 metres and rotates clockwise at a rate of one revolution every 30 minutes.

A seat starts at the lowest point P, when its height is one metre above the ground.

1. Find the height of a seat above the ground after 15 minutes. **[2]**
2. After six minutes, the seat is at point Q. Find its height above the ground at Q. **[5]**

The height of the seat above ground after *t* minutes can be modelled by the function .

1. Find the value of *b* and of *c* . **[6]**
2. Hence find the value of *t* the first time the seat is  above the ground. **[3]**

 **8.** Consider the following circle with centre O and radius *r* .



The points P, R and Q are on the circumference,  , for  .

1. Use the cosine rule to show that  . **[4]**
2. Let *l* be the length of the arc PRQ . Given that  , find the value of  . **[5]**
3. Consider the function  , for  . **[4]**

(i) Sketch the graph of *f* .

 (ii) Write down the root of  .

1. Use the graph of *f* to find the values of  for which  . **[3]**

 **9.** Consider the triangle ABC, where AB =10 , BC = 7 and  =  .

1. Find the two possible values of  . **[4]**
2. Hence, find  , given that it is acute. **[2]**

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