National 5 Maths Practice Paper A

Paper 2

You may use a calculator

1. The population of a city is increasing at a steady rate of 2.4% per annum. The current population is 528 000.

   What is the expected population in 4 years?

   Give your answer to the nearest thousand. 3

2. Two groups of 6 students are given the same test.

   (a) The marks of Group A are:

   73 47 59 71 48 62.

   Use an appropriate formula to calculate the mean and the standard deviation.

   Show clearly all your working. 4

   (b) In Group B, the mean is 60 and the standard deviation is 29.8.

   Compare the results of the two groups. 2

3. Multiply out the brackets and collect like terms.

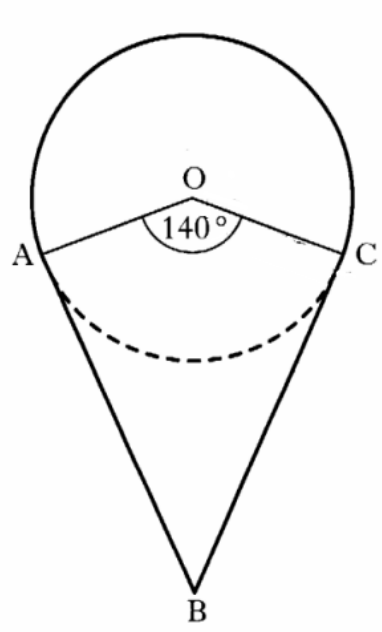
   $(x + 4)(2x^2 + 3x - 1)$ 3

5. The diagram shows a mirror which has been designed for a new hotel.

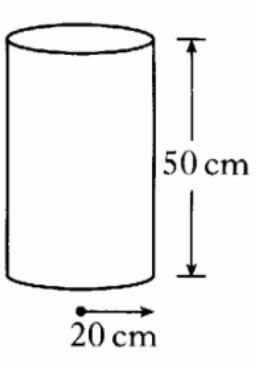
   The shape consists of a sector of a circle and a kite AOCB.

   - The circle, centre O, has a radius of 50 centimetres.
   - Angle AOC = 140°
   - AB and CB are tangents to the circle at A and C respectively.

   Find the perimeter of the mirror. 5



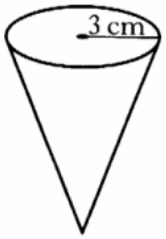
6. A drinks container is in the shape of a cylinder with radius 20 centimetres and height 50 centimetres.



(a) Calculate the volume of the drinks container.
Give your answer in cubic centimetres, correct to two significant figures.

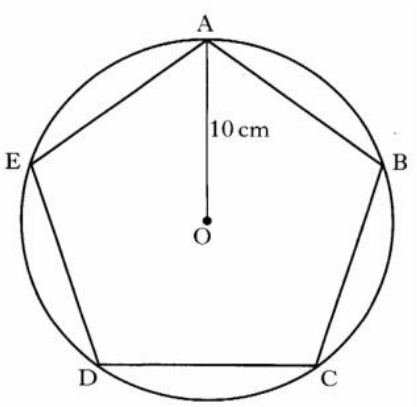
3

(b) Liquid from the full container can fill 800 cups, in the shape of cones, each of radius 3 centimetres.



What will be the height of liquid in each cup? 4

7.



A regular pentagon $ABCDE$ is drawn in a circle, centre O, with radius 10 centimetres.

Calculate the area of the regular pentagon. 5

8. (a) Express $a^2\left(2a^{-\frac{1}{2}}+a\right)$ in its simplest form. 2

10. A rectangular wall vent is 30 centimetres long and 10 centimetres wide.

It is to be enlarged by increasing both the length and the width by x centimetres.

(a) Show that the area, A square centimetres, of the new vent is given by

$$A = x^2 + 40x + 300.$$