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| **S3 Mathematics Homework Exercise 5** | | | | | | | | | C:\Users\Ian\Pictures\CHS.jpg | | |
|  | | | | | | | | |
| **Arcs and Sectors** | | | | | | | | |
|  | | | | | | | | | | | |
| Issued by: | | |  | | | | Return by: | |  | | |
|  | | | | | | | | | | | |
| **Working MUST be shown in every question.** | | | | | | | | | | | |
|  | | | | | | | | | | | |
| **Unless specified, give answers to 1 decimal place.** | | | | | | | | | | | |
|  | | | | | | | | | | | |
| **1.** | In each diagram below, find: | | | (i) | the length of arc AB | | | | | | |
|  |  | | |  |  | | | | | | |
|  |  | | | (ii) | the area of the sector ABO | | | | | | |
|  |  | | | | | | | | | | |
|  | a) | A  15mm  130°  O | | | | b)  B | | 58°  O  B  A  3.5m | | c) | 12cm  B  A  O  50° |
|  |  |  | | | |  | |  | |  |  |
| **2.** | a) | Arc PQ is 11.5cm long. | | | | b) | | This sector has area 94cm2. | | c) | Arc AB is 73cm long. |
|  |  |  | | | |  | |  | |  |  |
|  |  | Find the size of angle *x*. | | | |  | | Find the size of angle *y* . | |  | Find the radius of the circle. |
|  |  | P | | | |  | |  | |  |  |
|  |  | *x* °  9 cm  O  Q | | | |  | | 6 cm  *y* ° | |  | 245°  B  A |
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| **3.** | A party hat in the shape of a cone is made from the sector of a circle. | | | | | | | | | 18cm  20cm  *x* | |
|  |  | | | | | | | | |
|  | The circumference of the base of the cone is the length of the arc of the sector, and the sloping length of the cone is the radius of the sector. | | | | | | | | |
|  |  | | | | | | | | |
|  | The **cone** has a diameter of 18cm and a height of 20cm. | | | | | | | | |
|  |  | | | | | | | | |
|  | a) | Find the sloping length of the cone (marked *x* ) | | | | | | | |
|  |  |  | | | | | | | |
|  | b) | Hence, find the angle at the centre of the sector. | | | | | | | |
|  |  |  | | | | | | | |
|  | c) | Find the area of card used to make the hat,. | | | | | | | |
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| **Q.** | **Award 1 Mark for each ●:** | | | | | | | | | | |
|  |  | | | | | | | | | | |
| **1.** | a) | (i) | ●  x π x 30 | b) | (i) | ●  x π x 7 | | | c) | (i) | ●  x π x 24 |
|  |  |  | ● 34.03392… |  |  | ● 3.54….… | | |  |  | ● 64.9262481… |
|  |  |  | ● 34.0 mm |  |  | ● 3.5 m | | |  |  | ● 64.9 cm |
|  |  |  |  |  |  |  | | |  |  |  |
|  |  | (ii) | ●  x π x 152 |  | (ii) | ●  x π x 3.52 | | |  | (ii) | ●  x π x 122 |
|  |  |  | ● 255.254403… |  |  | ● 6.200…. | | |  |  | ● 389.557489…. |
|  |  |  | ● 255.3 mm2 |  |  | ● 6.2 m2 | | |  |  | ● 389.6 cm2 |
|  |  |  | | | | |  |  | | | |
| **2.** | a) | ● | | b) | ● | | | | c) | ● Arc = x π x D | |
|  |  | ●  x 360° | |  | ●  x 360° | | | |  | ● 73 = 2.138028…. x D | |
|  |  | ● 73.21127… | |  | ● 299.21193… | | | |  | ● D = 34.14360738… | |
|  |  | ● 73.2° | |  | ● 299.2° | | | |  | ● radius = 17.07180369… | |
|  |  |  | |  | ● 360 - 299.2° = 60.8° | | | |  | ● radius = 17.1 cm | |
|  |  |  | |  |  | | | |  |  | |
| **3.** | a) | ● x2 = 202 + 92 | | b) | ● Arc = π x 18 | | | | c) | ●  x π x 21.92 | |
|  |  | ● x2 = 481 | |  | ● Arc = 56.54866….. | | | |  | ● 197.1cm2 | |
|  |  | ● x = 21.9317122…. | |  | ● radius of sector = 21.9cm | | | |  |  | |
|  |  | ● x = 21.9cm | |  | ● C = π x 43.8 | | | |  |  | |
|  |  |  | |  | ● C = 137.60175…. | | | |  |  | |
|  |  |  | |  | ●  x 360° | | | |  |  | |
|  |  |  | |  | ● 147.945205… | | | |  |  | |
|  |  |  | |  | ● 147.9° | | | |  |  | |
|  |  | | | | | | | | | | |
|  | **Total = 45 marks** | | | | | | | | | | |