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Class: 3C3

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No. -

Maths D Holiday HW

Mensuration 2.1 P2

6a. $OA'B = OA'B'$

$$= 42 \text{ cm}$$

$$\text{Length of arc } BB' = \left(\frac{150^\circ}{360^\circ} \times 2 \times 42 \times 3.142\right) \text{ cm}$$

$$= 109.97$$

$$= 110 \text{ cm (3sf)} \#$$

b. Length of arc $AA' = \left(\frac{150^\circ}{360^\circ} \times 2 \times 7 \times 3.142\right) \text{ cm}$

$$= 18.3283 \dots$$

$$= 18.328 \text{ cm (5sf)}$$

$$\text{Ratio} = AA' : BB'$$

$$18.328 : 109.97$$

$$1 : 6.000$$

$$1 : 6$$

c. Area of sector $BB' = \left(\frac{150^\circ}{360^\circ} \times 42^2 \times 3.142\right) \text{ cm}^2$

$$= 2309.37 \text{ cm}^2$$

$$\text{Area of sector } AA' = \left(\frac{150^\circ}{360^\circ} \times 7^2 \times 3.142\right) \text{ cm}^2$$

$$= 64.1491 \dots$$

$$= 64.149 \text{ cm}^2 \text{ (5sf)}$$

$$\therefore \text{Area of screen which is wiped} = (2309.37 - 64.149) \text{ cm}^2$$

$$= 2245.221$$

$$= 2250 \text{ cm}^2 \text{ (3sf)} \#$$

7a. Shaded area = $[(3.9^2 \times 3.142) - (1.2^2 \times 3.142)] \text{ cm}^2$

$$= 43.265 \dots$$

$$= 43.3 \text{ cm}^2 \text{ (3sf) (shown)} \#$$

b. Area of each spool = $(43.265 \div 2) \text{ cm}^2$

$$= 21.6325 \text{ cm}^2$$

$$21.6325 = \pi (R^2 - r^2)$$

$$R^2 - 1.2^2 = 21.6325 \div \pi$$

$$R^2 = 21.6325 \div \pi + 1.2^2$$

$$\therefore R = \sqrt{(21.6325 \div \pi + 1.2^2)}$$

$$= 2.8852 \dots$$

$$= 2.89 \text{ cm (3sf)} \#$$

c. $3 \text{ hrs} = 10800 \text{ s}$

Length of tape = 23.4×10800

= 252720 mm

= 252.72 m

d. $43.3 \text{ cm}^2 = 4330 \text{ mm}^2$

Thickness of tape = $4330 \div 252720$

= $0.01713 \dots$

= $0.0173 \text{ mm (3sf)} \#$

8a. Vol. of earth = $(5^2 \times 3.142 \times 450) \text{ m}^3$

= $35347.5 \text{ m}^3 \#$

b(i). Area of $\triangle AOB = (\frac{1}{2} \times 5 \times 5) \text{ m}^2$

= $12.5 \text{ m}^2 \#$

b(ii). Area of sector AOB = $(\frac{90}{360} \times 5^2 \times 3.142) \text{ m}^2$

= 19.6375 m^2

Vol. of rubble = $[(19.6375 - 12.5) \times 450] \text{ m}^3$

= 3211.875

= $3200 \text{ m}^3 \text{ (3sf)} \#$

c(i). No of girders = $(450 \div 6) + 1$

= $76 \#$

c(ii). length of each girder = $(\frac{270}{360} \times 2 \times 5 \times 3.142) \text{ m}$

= 23.565 m

c(iii) Total length of steel used = $(23.565 \times 76) \text{ m}$

= 1790.94 m

9a. Length of minor arc PQ = $\left(\frac{150^\circ}{360^\circ} \times 2 \times 8 \times 3.142\right) \text{ cm}$
 $= 20.946 \dots$

$= 20.9 \text{ cm (3sf)} \#$

b. Area of $\triangle OPQ = \frac{1}{2} \times 8 \times 8 \times \sin 150^\circ$
 $= 16 \text{ cm}^2 \#$

c. Area of sector OPQ = $\left(\frac{150^\circ}{360^\circ} \times 8^2 \times 3.142\right) \text{ cm}^2$
 $= 83.7866 \dots$

$= 83.787 \text{ cm}^2 \text{ (5sf)}$

Shaded area = $(83.787 - 16) \text{ cm}^2$

$= 67.787$

$= 67.8 \text{ cm}^2 \text{ (3sf)} \#$

10i. Area of shaded region = $[(30^2 \times 3.142) - (15^2 \times 3.142)] \text{ cm}^2$
 $= 2120.85 \text{ cm}^2$

ii. Perimeter of shaded region = $[(2 \times 30 \times 3.142) + (2 \times 15 \times 3.142)] \text{ cm}$
 $= 282.78 \text{ cm}$