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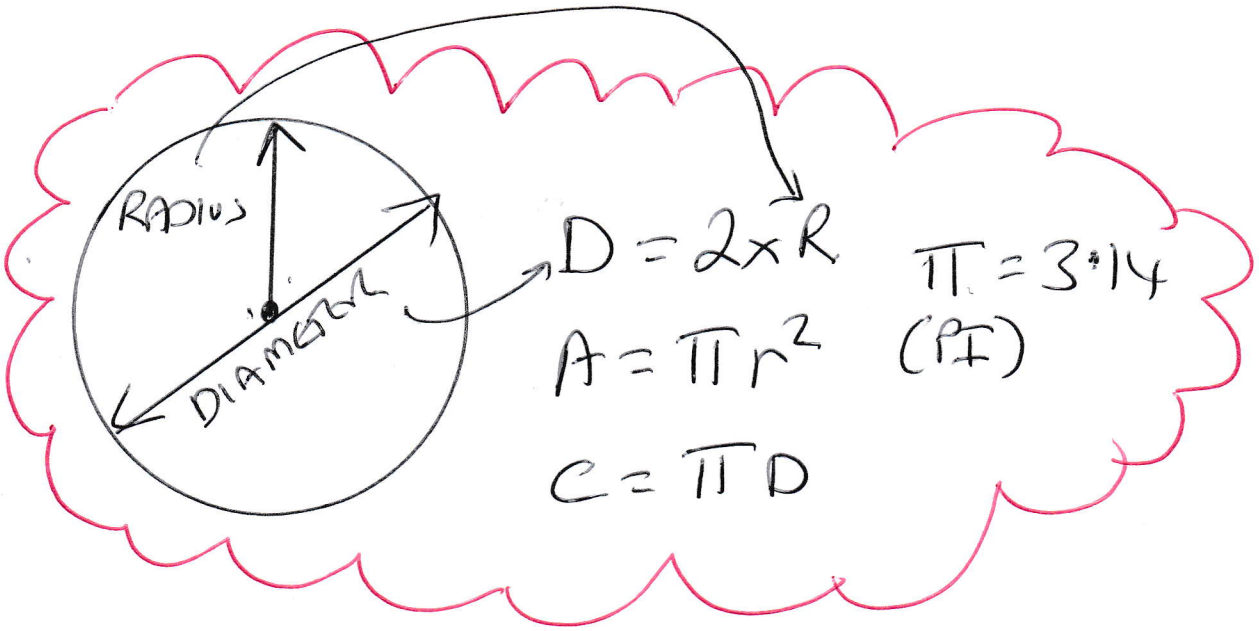
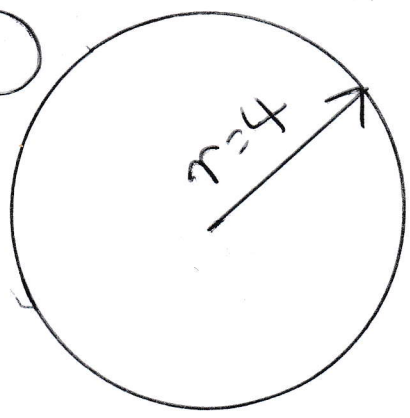
ES3 N5 Applications of Maths (Geometry & Measure)
Area & Circumference of Circles

Worked Solutions Courtesy of Mr R. Milton



1

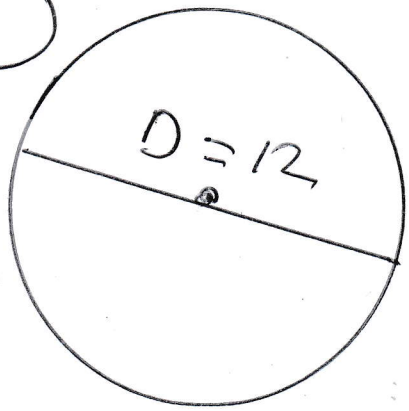


$D = 2 \times 4 = 8\text{cm}$ ✓

$C = \pi D = 3.14 \times 8 = 25.12\text{cm}$ ✓

$A = \pi r^2 = 3.14 \times 4^2 = 50.24\text{cm}^2$ ✓

2

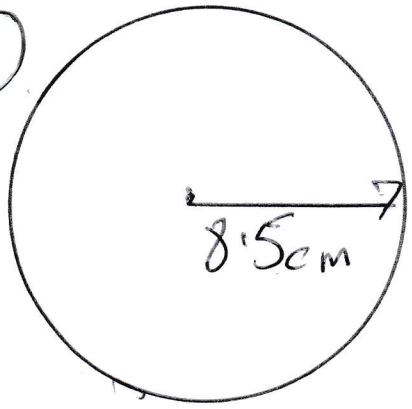


$R = 12 \div 2 = 6\text{cm}$ ✓

$C = \pi D = 3.14 \times 12 = 37.68\text{cm}$ ✓

$A = \pi r^2 = 3.14 \times 6^2 = 113.04\text{cm}^2$ ✓

(3)

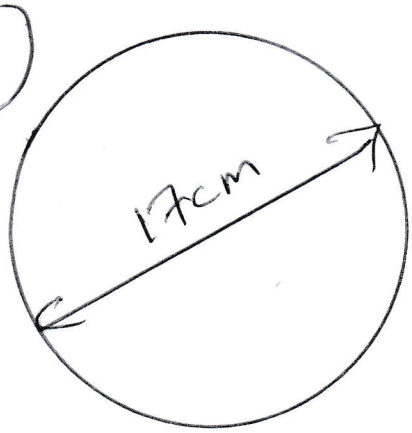


$D = 2 \times 8.5 = 17\text{cm}$ ✓

$C = \pi D = 3.14 \times 17 = 53.38\text{cm}$ ✓

$A = \pi r^2 = 3.14 \times 8.5^2 = 226.87\text{cm}^2$ ✓

(4)

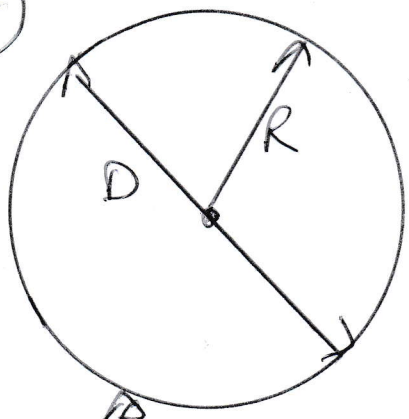


$R = 17 \div 2 = 8.5\text{cm}$ ✓

$C = \pi D = 3.14 \times 17 = 53.38\text{cm}$ ✓

$A = \pi r^2 = 3.14 \times 8.5^2 = 226.87\text{cm}^2$ ✓

(5)



$C = 28.26\text{cm}$

$C = \pi D$

$28.26 = 3.14 \times D$

$D = \frac{28.26}{3.14} = 9\text{cm}$ ✓

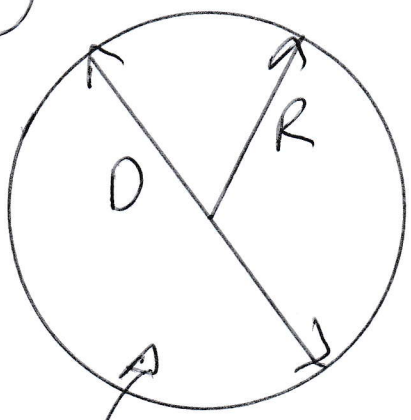
$R = 9 \div 2 = 4.5\text{cm}$ ✓

$A = \pi r^2$

$= 3.14 \times 4.5^2$

$= 63.59\text{cm}^2$ ✓

(6)



AREA = $314cm^2$

$A = \pi r^2$

$314 = 3.14 \times r^2$

$r^2 = \frac{314}{3.14}$

$r^2 = 100$

$r = \sqrt{100}$

$r = 10cm$ ✓

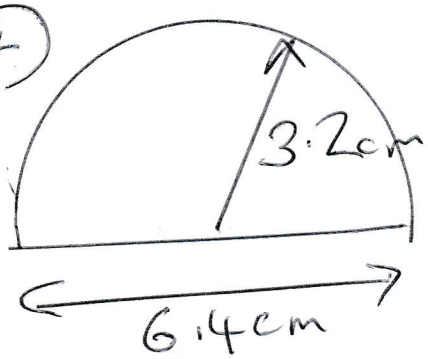
$D = 2r = 2 \times 10$

$D = 20cm$ ✓

$C = \pi D = 3.14 \times 20$

$C = 62.8cm$ ✓

(7)



(D)

$D = 2 \times 3.2 = 6.4cm$

$A = \pi r^2 \div 2$

$A = \frac{3.14 \times 3.2^2}{2} = 16.08$

$A = 16.08 cm^2$ ✓

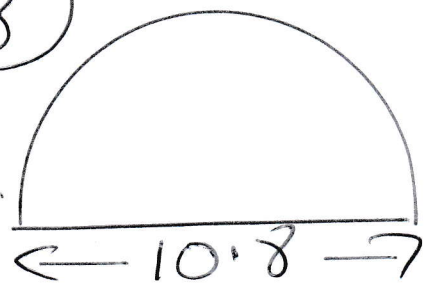
$C = \pi D$

$= 3.14 \times 6.4$

$= 20.10cm$ ✓

$P = \frac{20.10}{2} + 6.4 = 16.45cm$ ✓

8



$D = 10.8\text{ cm}$ ✓

$R = \frac{10.8}{2} = 5.4\text{ cm}$ ✓

$A = \pi r^2 \div 2$

$= (3.14 \times 5.4^2) \div 2$

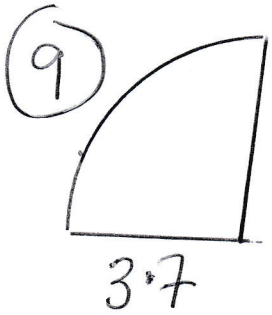
$= 45.78\text{ cm}^2$ ✓

$P = \frac{\pi D}{2} + 10.8$

$= \frac{3.14 \times 10.8}{2} + 10.8$

$P = 27.76\text{ cm}$

9



$D = 2R = 2 \times 3.7 = 7.4\text{ cm}$ ✓

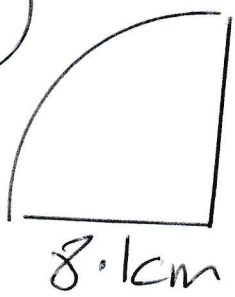
$A = \frac{\pi r^2}{4} = \frac{3.14 \times 3.7^2}{4} = 10.75\text{ cm}^2$ ✓

$P = \frac{\pi D}{4} + (2 \times 3.7)$

$= \left(\frac{3.14 \times 7.4}{4}\right) + 7.4$

$= 13.21\text{ cm}$ ✓

10



$D = 16.2$

$R = 16.2 \div 2 = \underline{8.1\text{cm}}$ ✓

$A = \frac{\pi r^2}{4} = \frac{3.14 \times 8.1^2}{4} = \underline{51.50\ \text{cm}^2}$ ✓

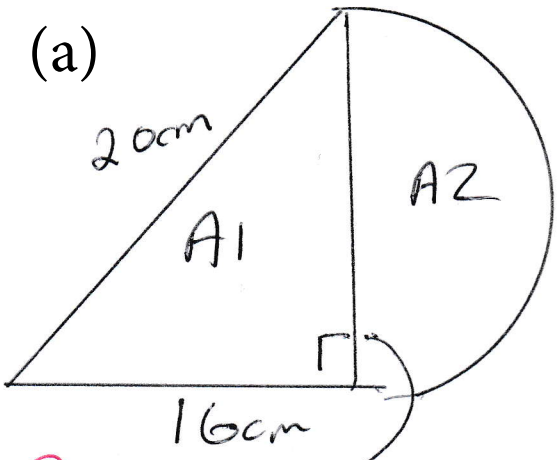
$P = \frac{\pi D}{4} + (2 \times 8.1)$

$= \frac{3.14 \times 16.2}{4} + 16.2$

$= \underline{28.92\text{cm}}$ ✓

AQ

(a)



$A_T = A1 + A2$

$= \frac{1}{2}BH + \frac{\pi r^2}{2}$

$= \left(\frac{1}{2} \times 16 \times 12\right) + \left(\frac{3.14 \times 6^2}{2}\right)$

$= 96 + 56.52$

$= \underline{152.52\ \text{cm}^2}$

DO FIRST

HEIGHT - USE PYTHAGORAS

$H^2 = 20^2 - 16^2$

$H^2 = 400 - 256$

$H = \sqrt{144}$

$\underline{H = 12}$

$\underline{D = 12\text{cm}}$

$\underline{R = 6\text{cm}}$

AREA OF DESIGN:

$= \underline{152.52\text{cm}^2}$ ✓

(b) $P = 20 + 16 + \left(\frac{3.14 \times 12}{2}\right)$

$= 36 + 18.84$

$= 54.84\text{cm}$ ✓