

Q1	3	9
Q2	3	11
Q3	11	11
Q4	17	17

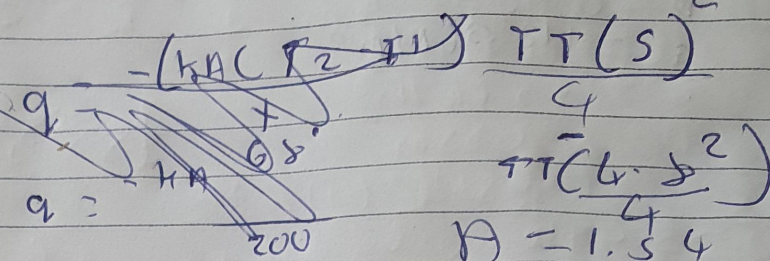
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34

0.8m
0.8m

$$T = 1.7 \text{ W/mK}$$

71%



Surface area of cylinder = πdh

$$-kA(T_2 - T_1)$$

①

$$-1.7 \times 1.54 \times (288 - 341) = 693.77 \text{ W}$$

$$693.77 / 1000 = 0.69 \text{ kW}$$

$$q = 12 \times 1.54 \times (288 - 341) = 0.98 \text{ kW}$$

①

$$2) F) 16.5 \times 10^3$$

①

$$T = 3.04 \times 10^{-6} \text{ N/m}^2$$

①

$$\frac{4A}{t} = d^2 = \sqrt{\frac{4A}{t}}$$

Diameter was given on the paper

$$D = \sqrt{4(542.76 \times 10^{-6})} = 26.28 \times 10^{-3}$$

$$26.28 \times 10^{-3}$$

$$= 2.2$$

$$= 3 \text{ bolts}$$

✓

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3) $F = 10 \text{ Nmm}$

$x = 0.14 \text{ m}$

$G = 78 \text{ GPa}$

$$J = \frac{S\sqrt{3}}{8} \cdot s^4$$

$$\frac{T}{S} = \frac{T}{L} = \frac{G\theta}{L}$$

$$J = \frac{S\sqrt{3}}{8} \cdot s^4 = \frac{S\sqrt{3}}{8} \cdot 0.05^4 = 6.77 \times 10^{-10}$$

$\theta_{TL} = \frac{10 \times 0.14}{G \cdot J} = 26.51$

$\frac{26.51 \times 10^{-3}}{1.52} = 1.52$

yay

4) $M = 6200 \text{ Nmm}$

$E = 210 \text{ GPa}$

$B = 0.055 \text{ m}$

$D = 0.11 \text{ m}$

$b = 0.04 \text{ m}$

$d = 0.08 \text{ m}$

$$I = \frac{B^3}{12} + \frac{bd^3}{12}$$

$$I = \frac{B^3}{12} + \frac{bd^3}{12} = \frac{0.055^3}{12} + \frac{0.04 \times 0.08^3}{12} = 5.5 \times 10^{-8}$$

$R = \frac{EJ}{M} = \frac{210 \times 10^9 \times 5.5 \times 10^{-8}}{6200}$

186.29 m

$\sigma = \frac{E\theta}{R} = \frac{210 \times 10^9 \times 0.055}{186.29} = 62 \times 10^6 \text{ N/m}^2$

yay!