ERRATA for

FE Mechanical Practice Exam

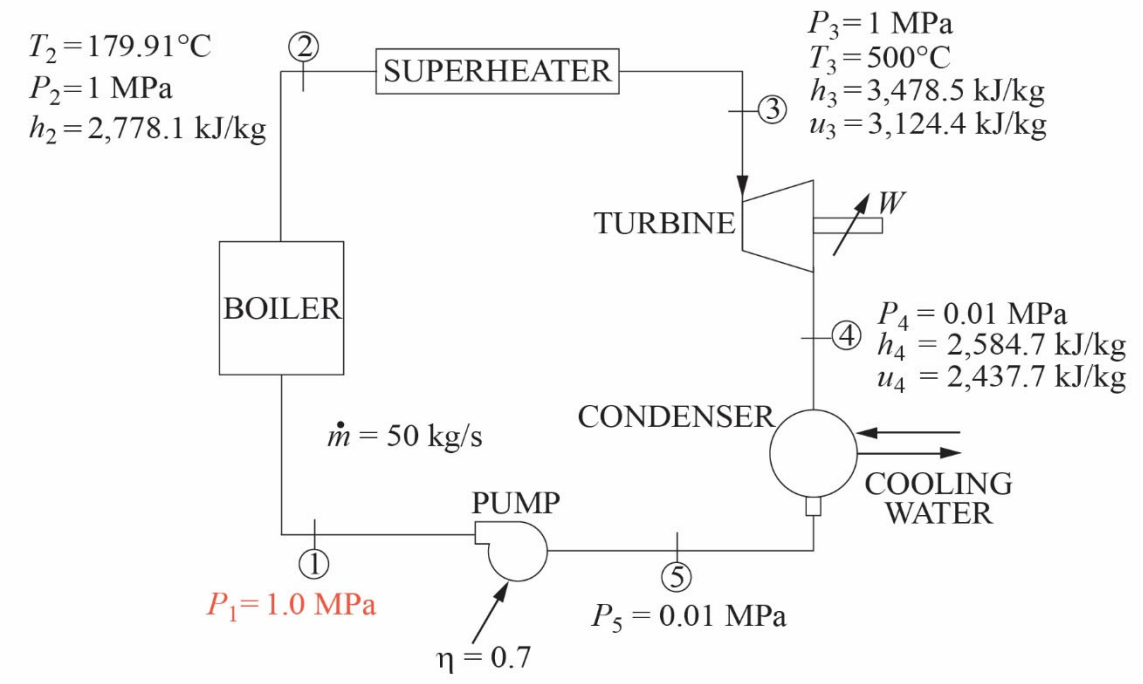
ISBN: 978-1-932613-99-5

Errata posted 02/02/2022

Revisions are shown in red.

Question 67, p. 44

The illustration should be shown as follows:



Solution 12, p. 70

~~Refer to the Intellectual Property section in the Ethics chapter of the *FE Reference Handbook*.~~

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THE CORRECT ANSWER IS: D

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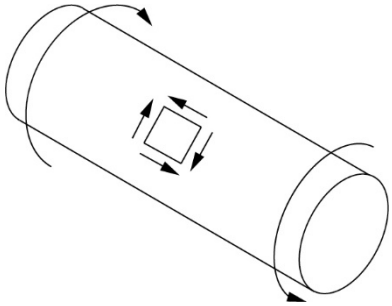
Solution 46, p. 91

Refer to the Torsion section in the Mechanics of Materials chapter of the *FE Reference Handbook.*

The polar moment of inertia for a solid cylinder is



$$J = \frac{\pi r^4}{2} = \frac{\pi\left(\frac{d}{2}\right)^4}{2} = \frac{\pi d^4}{2(2)^4} = \frac{\pi d^4}{2(16)} = \frac{\pi d^4}{32}$$

The equation for the shear stress

$$\tau = \frac{Tr}{J} = \frac{T\left(\frac{d}{2}\right)}{J}$$

Substituting for polar inertia into the equation for the shear stress gives

$$\tau = \frac{Tr}{J} = \frac{T\left(\frac{d}{2}\right)}{\frac{\pi d^4}{32}} = \frac{16T}{\pi d^3}$$

Solving for torque gives

$$T = \frac{\pi d^3 \tau}{16} = \frac{\pi(0.2)^3(840 \times 10^3)}{16}$$

$$T = 1{,}319 \text{ N·m}$$

THE CORRECT ANSWER IS: C

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Solution 95, p. 114

Refer to the Hooke's Law section in the Mechanics of Materials chapter of the *FE Reference Handbook*.

The formula for the total longitudinal strain without a temperature rise is:

$$\varepsilon_{axial} = \frac{1}{E}\left(\sigma_l - \nu\left(\sigma_t + \sigma_r\right)\right) = \frac{1}{210 \times 10^3 \text{ MPa}}\left(23.1 \text{ MPa} - 0.24\left(46.2 \text{ MPa} + 0\right)\right) = 5.72 \times 10^{-5}$$

This must be converted to displacement using the following formula:

$\varepsilon_{axial} = \frac{\delta l}{l}$, where l is the length of the section under consideration

$\delta l = \varepsilon_{axial} \times l$

$= 5.72 \times 10^{-5} \times 1{,}000 \text{ mm}$

$= 0.0572 \text{ mm}$

THE CORRECT ANSWER IS: A

Solution 99, p. 117

The first line of the solution should read as follows:

Use the Failure by Pure Shear equation from the Joining Methods section in the Mechanical Engineering chapter of the *FE Reference Handbook*.