ERRATA for
FE Civil Practice Exam

ISBN: 978-1-932613-97-1

Errata posted 4/1/2023

Revisions are shown in red.

Question 8, p. 11:
The options should read as follows:

- ○ A. (19.5%, 26.9%)
- ○ B. (20.3%, 26.1%)
- ○ C. (20.6%, 25.8%)
- ○ D. (20.9%, 25.5%)

Question 23, p. 19:
The options should read as follows:

- ○ A. 78.0
- ○ B. 78.6
- ○ C. 118.5
- ○ D. 168.4

Question 37, p. 24:
Ready-mixed concrete is found to have a slump less than specified. Without compromising strength, which of the following is the most appropriate corrective action?

- ○ A. Decrease the amount of water in the mix before the truck leaves the ready-mix plant.
- ○ B. Increase the water to the mix in the truck at the jobsite before the concrete is poured.
- ○ C. Add a water-reducing admixture to the mix before the concrete is poured.
- ○ D. Increase the rotation speed of the mixing drum while the truck is in transit to the jobsite.

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Question 40, p. 25:
The following preliminary concrete mix has been designed assuming that the aggregates are in oven-dry condition. The actual moisture contents of the aggregates are shown below:

Water = 305 lb/yd^3
Cement = 693 lb/yd^3

The properties of the aggregates and actual moisture contents used in the mix are shown below:

Property	Coarse Aggregate	Fine Aggregate
Moisture content at SSD	0.5%	0.7%
Moisture content as used in mix	2.0%	6.0%
SSD weight	1,674 lb/yd^3	1,100 lb/yd^3

The amount of water (lb/yd^3) that would be used in the final mix is most nearly:

- ○ A. 206
- ○ B. 222
- ○ C. 305
- ○ D. 388

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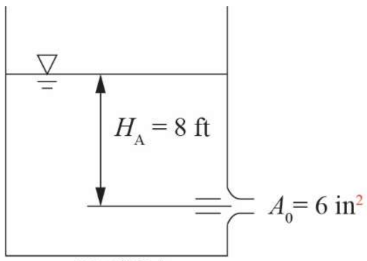
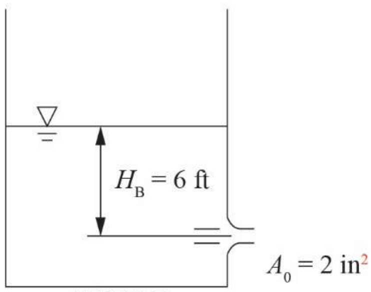
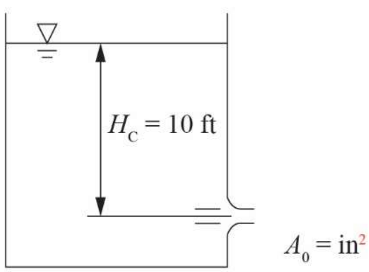
Question 47, p. 30:
The illustration should be shown as follows:



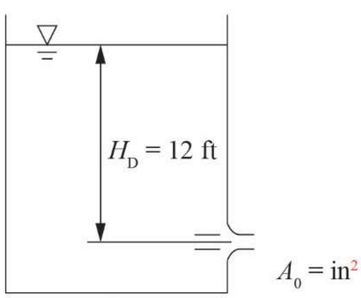
TANK A



TANK B



TANK C



TANK D

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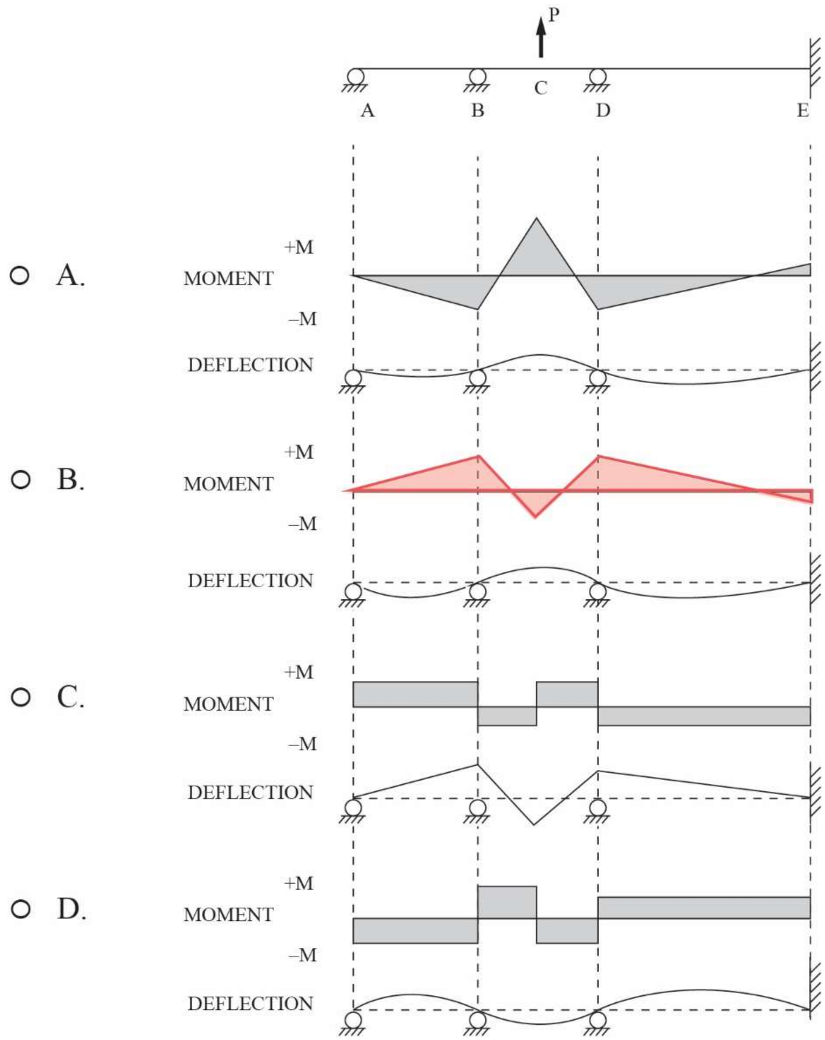
Question 68, p. 42:
Option B should be drawn as follows:

Which combination of moment diagram and deflection shape most accurately corresponds to the continuous beam with loading shown?



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Question 95, p. 55:
The options should read as follows:

- ○ A. behind schedule with a cost savings
- ○ B. ahead of schedule with a cost savings
- ○ C. behind schedule with a cost overrun
- ○ D. ahead of schedule with a cost overrun

Solutions Table, p. 60:
8: The correct answer is B.
78: The correct answer is B.
91: The correct answers are A, B, C.

Solution 8, p. 63:
Refer to the t-Distribution section in the Engineering Probability and Statistics chapter of the *FE Reference Handbook*.

For a 99% confidence interval, $\alpha = 0.01 \rightarrow \alpha/2 = 0.005$.

Use Student's t-distribution with $\nu = 3$. Refer to the table, where $t_{0.005,3} = 5.841$.

Confidence interval $= 23.2\% \pm [5.841 \times (1/2)] = 23.2\% \pm 2.921\% = (20.3\%, 26.1\%)$

THE CORRECT ANSWER IS: B

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Solution 23, p. 70:

Refer to the Moment of Inertia section in the Statics chapter of the *FE Reference Handbook*.

$I_{xc} = h^3(a^2 + 4ab + b^2)/36(a + b)$

$= 6^3[(3^2 + (4 \times 3 \times 6) + 6^2)]/[36 \times (3 + 6)]$
$= 78 \text{ in}^4$

$y_c = 6[2(3) + 6]/[3 \times (3 + 6)] = 2.667$ in.
$4.5 – 2.667 = 1.83$ in

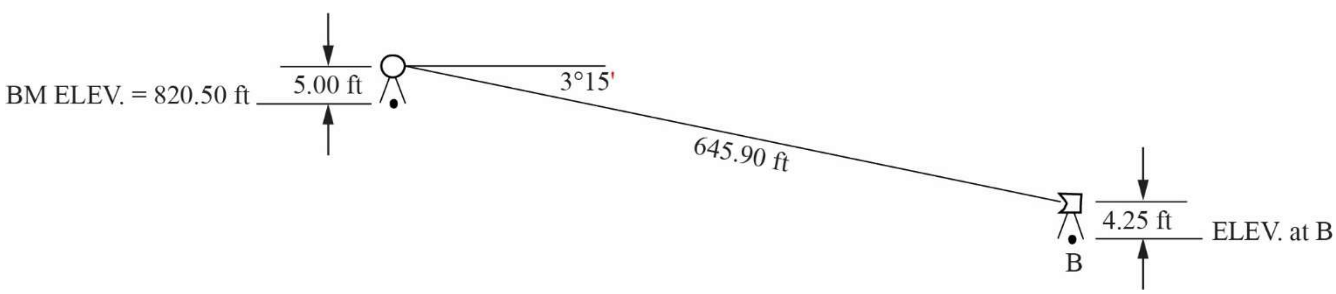
$A = h(a + b)/2$
$A = 6(3 + 6)/2 = 27 \text{ in}^2$

$I_{x'} = I_{xc} + d_y^2 A$
$= 78 + (1.83^2)(27)$
$= 168.4 \text{ in}^4$

THE CORRECT ANSWER IS: D

Solution 52, p. 81:

The figure should be shown as follows:



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Errata posted 4/1/2023

Solution 67, p. 90
An alternate solution for this question is as follows:

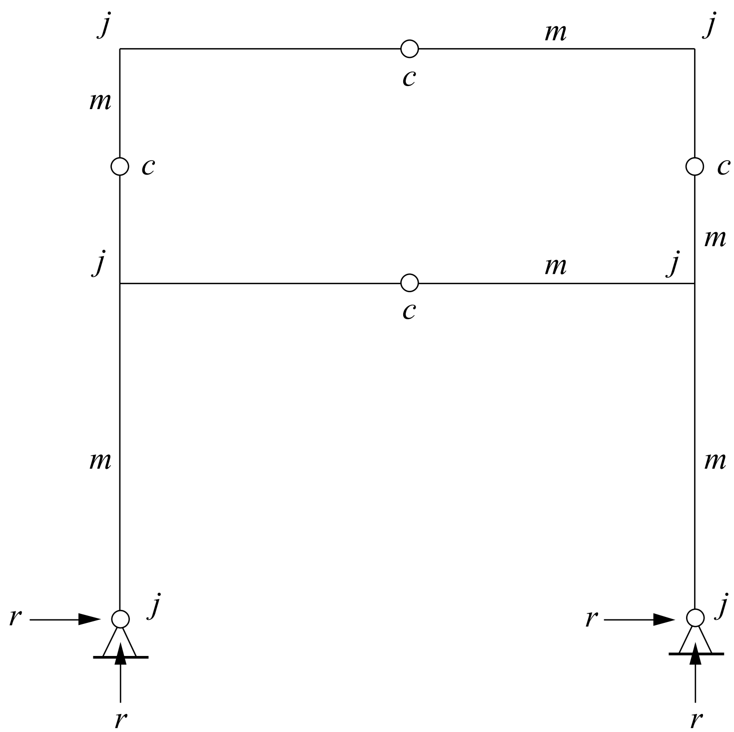
Refer to the Stability, Determinacy, and Classification of Structures section in the Civil Engineering chapter of the *FE Reference Handbook*.

For a plane frame:

m = number of members = 6 (4 columns, two beams)
r = number of independent reaction components = 4 (x and y reactions at base of both columns)
j = number of joints = 6 (base of each column, each beam-column connection)
c = number of condition equations based on known internal moments or forces = 4 (each internal pin)

$3(m) + r = 3(j) + c$

3(6) + 4 = 3(6) + 4 so frame is stable and statically determinate.



THE CORRECT ANSWER IS: B

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Solution 71, p. 93:

The solution should read as follows:

Refer to the Design of Reinforced Concrete Components (318-14) section in the Civil Engineering chapter of the *FE Reference Handbook*.

$$A_s = 5.08 \text{ in}^2 \text{(given)}$$

$$b = 12 \text{ in. (given)}$$

$$a = \frac{A_s f_y}{0.85 f'_c b} = \frac{5.08(60)}{0.85(4)(12)} = 7.47 \text{ in.}$$

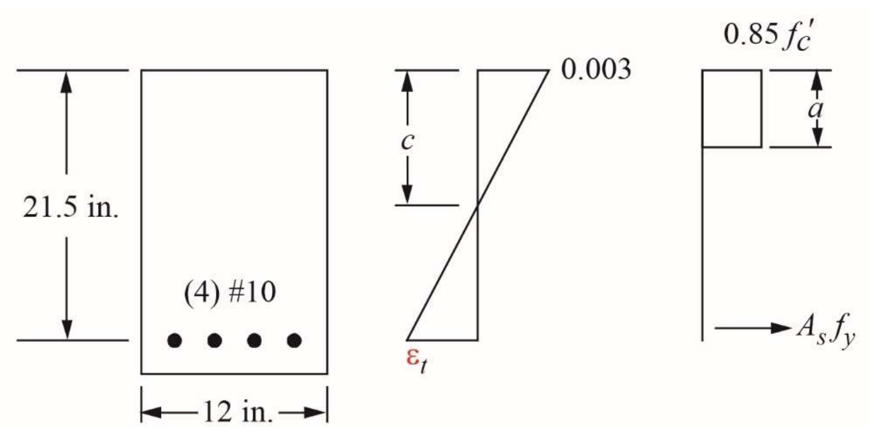
$$\beta_1 = \frac{a}{c} \therefore c = \frac{a}{\beta_1} = \frac{7.47}{0.85} = 8.79 \text{ in.}$$

$$d_t - c = 21.5 - 8.79 = 12.71 \text{ in.}$$

$$\varepsilon_t = \frac{d_t - c}{c}(0.003) = \frac{12.71}{8.79}(0.003) = 0.004338 \text{ in./in.}$$

Since $0.004 < \varepsilon_t < 0.005$, compute ϕ:

$$\phi = 0.48 + 83(0.004338) = 0.84004 = 0.84$$



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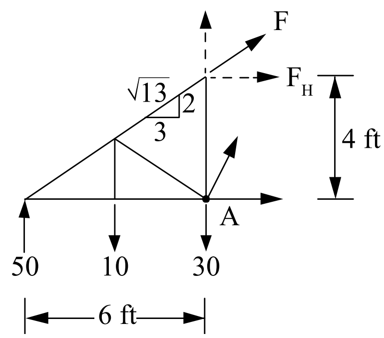
Errata posted 4/1/2023

Solution 72, p. 94

72. Cut the truss through members CD, DK, and JK and draw a free-body diagram of the left side.



Let F = force in Member CD

F_H = the horizontal component of F

Then $F_H = \dfrac{3}{\sqrt{13}} F$

Solving for F: $F = \dfrac{\sqrt{13}}{3} F_H$

$\uparrow \sum M_A = 50 \text{ kips}(6\text{ ft}) - 10 \text{ kips}(3\text{ ft}) + F_H(4\text{ ft}) = 0$

$F_H = -67.5 \text{ kips}(\text{comp})$

$F = \dfrac{\sqrt{13}}{3}(67.5 \text{ kips}) = 81.12 \text{ kips}(\text{comp})$

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Solution 83, p. 100:
The solution should read as follows:

Refer to the Retaining Walls section in the Civil Engineering chapter of the *FE Reference Handbook*.

Given:
$L_S = 100$ ft, $W_S = 1$ ft
$\alpha_S = 27°$
$W_M = 100$ tons = 200,000 lb
$\phi = 20°$
$c = 1.2$ psi = 173 psf

$$FS = \frac{T_{\text{FF}}}{T_{\text{MOB}}} = \frac{cL_S + W_M \cos\alpha_S \tan\phi}{W_M \sin\alpha_S}$$

FS = [(173 psf)(100 ft)(1 ft) + (200,000 lb)(cos 27°)(tan 20°)]/(200,000 lb)(sin 27°) = 0.9

THE CORRECT ANSWER IS: B

Solution 87, p. 101
WALK + width/pedestrian speed = green

$G_p = 3.2 + L/S_p + 0.27N_{ped}$

The first and third terms of the minimum green equation refer to the pedestrian WALK interval, which was given in the problem as 6.0. The middle term represents the DON'T WALK interval, which needs to be calculated based on the pedestrian crossing time.

$G_p = 6.0 + (31.5/3.5) = 15.0$ sec

THE CORRECT ANSWER IS: D

Solution 91, p. 103
Option A: True. A 75-mph free-flow speed freeway has a breakpoint of 1,000 pc/h/ln, while a 55-mph freeway has a breakpoint of 1,800 pc/h/ln. The breakpoint is defined by the *Highway Capacity Manual* as the volume for which the operating speeds becomes lower than the free-flow speed.

THE CORRECT ANSWERS ARE: A, B, C