

112022-2

4-2426

Your vessel's drafts are: FWD 17'-05", AFT 20'-01"; and the KG is 22.4 feet. What is the righting moment when the vessel is inclined to 15°? (Use the reference material in Section 1, the blue pages, of the Stability Data Reference Book)

A. 10,656 foot-tons
Correct.

B. 12,340 foot-tons
Incorrect.

C. 13,980 foot-tons
Incorrect.

D. 17,520 foot-tons
Incorrect.

Step 1:

Find Mean Draft.

$$\text{Fwd Draft } 17'-05'' + \text{Aft Draft } 20'-01'' = 37'-06''$$

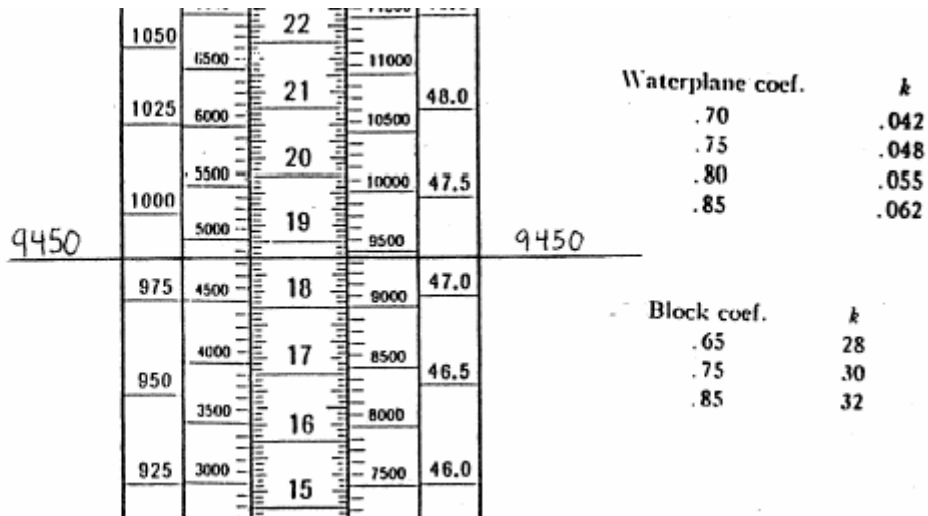
$$\text{Mean Draft} = 37'-06''/2$$

$$\text{Mean Draft} = \mathbf{18'-09''}$$

Step 2:

Find the displacement of the vessel by using the mean draft and the Deadweight Scale (Blue Pages).

$$\text{Displacement} = \mathbf{9450 \text{ tons}}$$



Step 3:

Find the change in the center of gravity between the actual KG and the assumed KG for the vessel..

Actual KG: 22.4'

Table KG: 20.0' -

GGI: 2.4'

Step 4:

Find the corrected righting arm due the change in the center of gravity.

$$\begin{aligned}\text{correction} &= GG_1 \times \sin \text{Angle (angle of list)} \\ &= 2.4' \times \sin 15^\circ \\ &= 2.4' \times .2588 \text{ (.2588 is } \sin 15^\circ \text{ to four decimal places. Not .25 stated in the Cross Curves.} \\ &= 0.62'\end{aligned}$$

$$\text{Corrected GZ} = \text{GZ} - \text{correction}$$

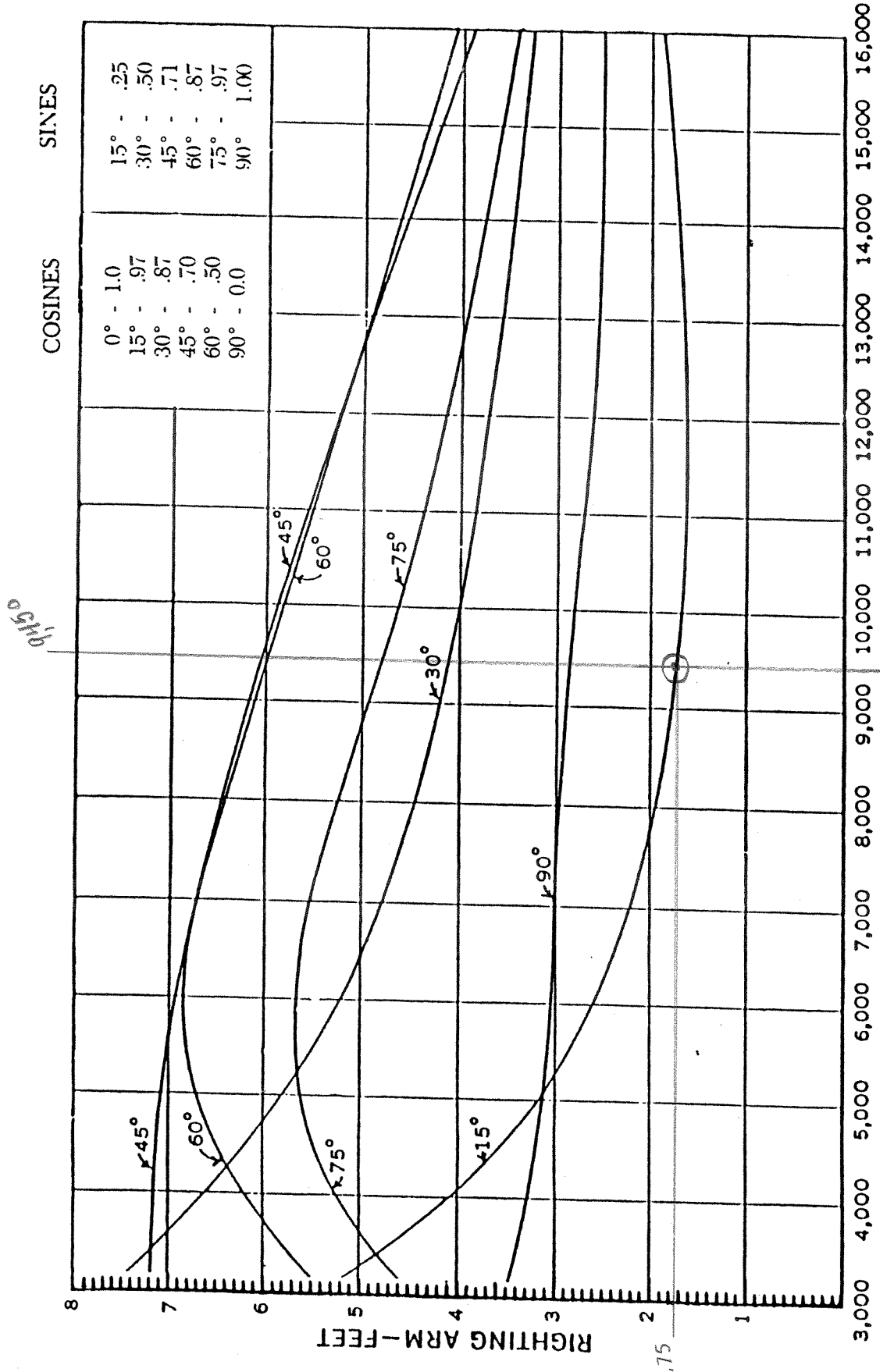
*** for GZ, find the intersection of the curved line for inclination (15°) and displacement tonnage (9,450) in the Cross Curves (Blue Pages)

$$\begin{aligned}&= 1.75' - 0.62' \\ &= \mathbf{1.13'}\end{aligned}$$

Step 5:

Find the righting moment.

$$\begin{aligned}\text{Righting Moment} &= \text{GZ} \times \text{Weight (displacement)} \\ &= 1.13' \times 9,450 \text{ tons} \\ &= \mathbf{10,656 \text{ foot-tons}}\end{aligned}$$



DISPLACEMENT TONS
 KG assumed to be 20.00 feet