

You are using tackle number 4 in illustration D029DG to lift a weight of 120 lbs. If you include 10 percent of the weight for each sheave for friction, what is the pull on the hauling part required to lift the weight?



- A. 20 lbs.
Incorrect
- B. 30 lbs
Incorrect
- C. 42 lbs
Correct
- D. 57 lbs
Incorrect

See Solution on the next page

$$\mathbf{F/W = 1 + ((1/10 \times \text{number of sheaves}) / \text{T.M.A.})}$$

from Merchant Marine Officers' Handbook

F = force (in pounds or tons) to be applied at the hauling end of the block

W = weight to be lifted

T.M.A. = theoretical mechanical advantage, the ratio of W to F, assuming no friction

$$\mathbf{F/120 \text{ lbs.} = 1 + ((1/10 \times 4) / 4) \quad \text{*** T.M.A.} = 4 \text{ since there are six lines between the two blocks AND the tackle is reeved to advantage (through a moving block)}$$

$$\mathbf{F = 120 \times (1 + 0.4) / 4}$$

$$\mathbf{F = 42.0 \text{ lbs.}}$$