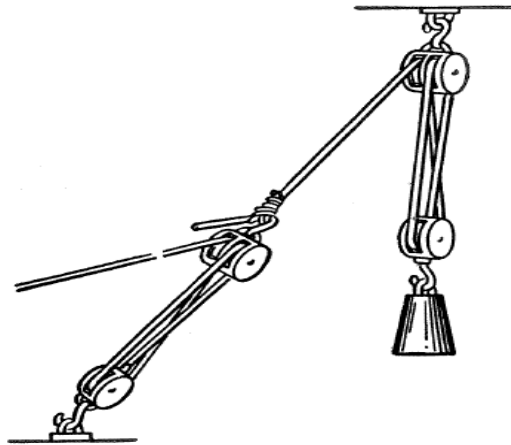


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You are using tackle number 10 to lift a weight. The hauling part of this tackle is bent to the weight hook (w) of tackle number 5. What is the mechanical advantage of this rig? (See Diagram D029DG)

Note: This is one example of a hauling part of one tackle “bent” to the weight hook of another tackle. This does not represent the configuration in the question.



- A. 25
Correct. See Solution.
- B. 20
Incorrect.
- C. 15
Incorrect.
- D. 10
Incorrect.



Solution:

- 1) Mechanical advantage (MA) of a block and tackle is the ratio of the weight lifted to the amount of power or force exerted to lift it.
- 2) A tackle is said to be rigged “to advantage” when hauling on the part of a line that leads through a *movable* block, and “to disadvantage” when hauling on the part of a line that leads through a *fixed* block. Tackle number 5 is rigged to disadvantage and tackle number 10 is rigged to advantage.
- 3) The number of parts of a line supporting the load determines the mechanical advantage. If the tackle is rigged to advantage then the mechanical advantage is increased by one. For example, tackle number 5 has a mechanical advantage of 5 (count the lines between the two blocks). Tackle number 10 has a mechanical advantage of 5 (4 parts of the line between the block and tackle number 10 is rigged to advantage, therefore, you add one for a final mechanical advantage of 5).
- 4) If one tackle is “bent” onto another, multiply the individual mechanical advantage of each to get the total mechanical advantage of the combined system.

Total MA = (MA of block number 10) X (MA of block number 5)

Total MA = 5 x 5

Total MA = 25