BLACKJACK BALANCING ACT

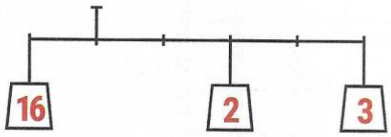
BY ERICH FRIEDMAN

Each of the weights in the problems below weighs a positive whole number of ounces. Your job is to enter the appropriate numbers into the blank weights so that the system balances at each pivot and *each horizontal row of weights adds up to 21*.

To accomplish this feat, you must apply the "law of levers": The further a weight is from a fulcrum (pivot), the more leverage it has. In fact, the leverage of any weight equals its magnitude times the length of the lever arm. For example, a four-ounce weight five inches to the left of a pivot balances a two-ounce weight ten inches to the right, since $4 \times 5 = 2 \times 10$. If more than one weight hangs on one side of a pivot, you can add up the leverages on that side.

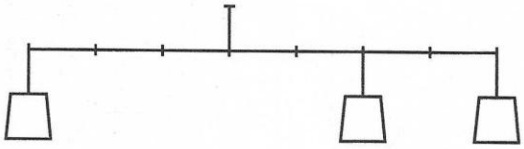
Note: The weights placed in each puzzle do not have to be different. Assume that the strings and horizontal rods are weightless. You'll get the hang of it in no time!

EXAMPLE

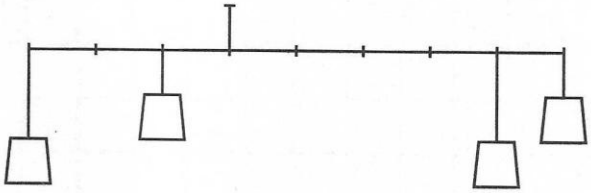


$16 + 2 + 3 = 21$ and
$16 = (2 \times 2) + (3 \times 4)$

1



2



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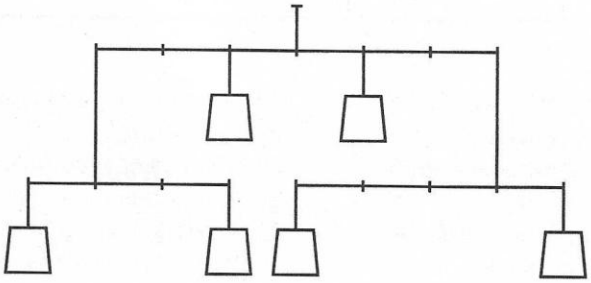

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