

The original problem is below. Precious metals including gold and silver are measured in the troy system: 1 pennyweight = 24 grains, 1 ounce = 20 pennyweight, 1 pound = 12 ounces. This means that 1 ounce = 480 grains.

Most other things are measured in the avoirdupois system: 1 ounce = 437.5 grains, 1 pound = 16 ounces. Which means that 1 pound = 7000 grains.

The grain in both systems is the same. Thus we can convert both prices into grains. Steak at \$8.33/lb avoirdupois is the same as $8.33/7000 = 1.19/1000$ \$/grain. Silver at \$36 /oz troy is the same as $36/480 = 3/40$ \$/grain.

Let x be the number of grains of silver purchased. Then

$3/40 x + (1.19/1000)(4x) = 957.12$. Solving this for x we find that $x = 12000$. Converting x from grains to troy ounces, gives us that then number of ounces of silver to be purchased is 25.

Weighty Matters

Sam has \$957.12 which he plans to use to buy steak and silver bars. If steak costs \$8.33 per pound and silver costs \$36 per ounce and he wants to buy 4 times as much steak as silver by weight, how many ounces of silver should George buy?

Hint: an ounce of gold does not weigh the same as an ounce of feathers.