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Complex Conversions

- A. Two cars compete for fuel efficiency. Car A gets 40 mpg and car B gets 16 km / L. Which car is more efficient?

$$(16 \text{ km / L}) \cdot (3.78541 \text{ L / 1 gal}) \cdot (1000 \text{ m / 1 km}) \cdot (1 \text{ mile / 1609.34 m}) \\ = 37.6 \text{ mile / gal} = 37.6 \text{ mpg}$$

Car A is more efficient.

- B. A cigarette contains 15 mg of tar; the tar will "stick" to the smoker's lungs. There are 20 cigarettes in a pack. After 10 years of smoking 2 packs a day, how many pounds of tar will the lungs contain?

$$(10 \text{ years}) \cdot (365 \text{ days / year}) \cdot (2 \text{ pack / day}) \cdot (20 \text{ cig / pack}) \cdot (15 \text{ mg tar / cig}) \\ = 2.19 \times 10^6 \text{ mg of tar}$$

$$(2.19 \times 10^6 \text{ mg of tar}) \cdot (1 \text{ g / 1000 mg}) \cdot (1 \text{ kg / 1000 g}) \cdot (2.20462 \text{ lbs / kg}) \\ = 4.83 \text{ lbs of tar}$$

After 10 years of smoking, approximately 5 pounds of tar is in the lungs.

- C. Cigarettes cost around \$7.00 a pack. Using data from above, determine the amount of money it will cost to accumulate approximately 5 pounds of tar in your lungs?

$$(10 \text{ years}) \cdot (365 \text{ days / year}) \cdot (2 \text{ pack / day}) \cdot (\$7.00 / \text{pack}) = \$51,100$$