

Crude Oil and Gas Mileage

According to the U.S. Energy Information Administration, a barrel of crude oil produces approximately 20 gallons of gasoline. EPA mileage estimates indicate a 2011 Ford Focus averages 28 miles per gallon of gasoline.

- Write an expression for $G(x)$, the number of gallons of gasoline produced by x barrels of crude oil.
- Write an expression for $M(g)$, the number of miles on average that a 2011 Ford Focus can drive on g gallons of gasoline.
- Write an expression for $M(G(x))$. What does $M(G(x))$ represent in terms of the context?
- One estimate (from [Oilvoice](#)) claimed that the 2010 Deepwater Horizon disaster in the Gulf of Mexico spilled 4.9 million barrels of crude oil. How many miles of Ford Focus driving would this spilled oil fuel?



Commentary

In reference to the solution for part d), in 2010, Ford sold just over 170,000 Focus models. The oil spilled from the Deepwater Horizon disaster would allow EACH Ford Focus sold in 2010 to drive over 15,000 miles.

Based on a problem by Hilton Russel.

Solution: Crude Oil and Gas Mileage

- a. At 20 gallons per barrel, x barrels produces $20x$ gallons so $G(x) = 20x$.
- b. At 28 miles per gallon, g gallons of gasoline will allow the Ford Focus to drive $28g$ miles so $M(g) = 28g$.
- c. We have

$$M(G(x)) = M(20x) = 28(20x) = 560x.$$

The composition $M(G(x))$ represents the number of miles that may be driven on gasoline refined from x barrels of crude oil.

- d. $M(G(4.9 \text{ million})) = 560(4.9 \text{ million}) = 2.744 \text{ billion miles}$.

