# Paying at the Pump

The gasoline that powers your parent's car has already been through quite a lot by the time it gets to the pump. Gasoline comes from crude oil found deep beneath the Earth's surface and oceans. Once crude oil is discovered, it is piped out of the ground and transported to a refinery to be processed into gasoline, home heating oil, aviation fuel and other products.

The price you pay at the pump includes several costs. Distribution and marketing costs include the fees incurred in shipping the gasoline through pipelines from the refinery, and loading it into trucks for delivery to gas stations. National, state and local taxes are charged at the pump and vary by state and city. Most taxes go toward roads, highways, mass transit and environmental funds.

The stages of discovering and converting crude oil to gasoline and moving it to your car's tank all contribute to the price of a gallon of gasoline.

Use the table to answer the questions below:
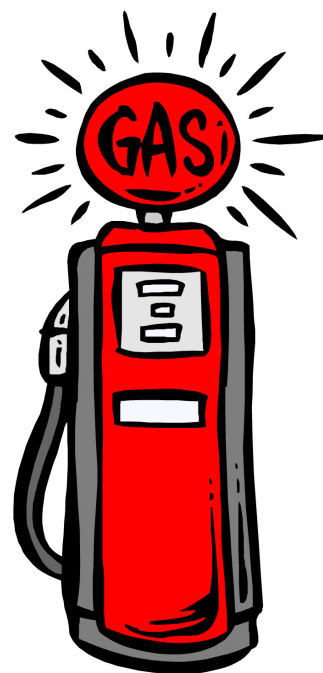
2004 Average Retail Price: $ 2.00/gallon		
	Fraction of average Retail Price	Average Price in dollars
Distribution & Marketing	$\dfrac{1}{10}$	
Refining Costs & Profits	$\dfrac{1}{5}$	
Federal & State Taxes	$\dfrac{1}{5}$	
Crude Oil	$\dfrac{1}{2}$	

2005 Average Retail Price: $ 2.80/gallon		
	Fraction of average Retail Price	Average Price in dollars
Distribution & Marketing		$ 0.28
Refining Costs & Profits		$ 0.42
Federal & State Taxes		$ 0.56
Crude Oil		$ 1.54

1. Complete the table above.

2. If a person drives a car with a $12\frac{3}{4}$ gallon tank, how much more would he or she spend in 2005 to cover the cost of Crude Oil on a full tank of gas than in 2004 (round your answer to the nearest cent)?

3. The price of crude oil increased in 2006 so that it accounted for $\frac{3}{5}$ of a gallon of gasoline by mid-year. If that gallon cost $3.40 retail, how much of the cost in dollars is from crude oil?

If the fraction of costs related to taxes didn't change from 2005, how much did the cost of distribution & marketing and refining costs & profits change in dollars in 2006?

4. At the end of 2005, the gas companies were being criticized for raising gas prices and making more money. The gas companies claimed they were actually making less than in 2004. Were they telling the truth? Explain your answer in complete sentences.

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Patterns in Fraction Products

Find each product

a. $\left(1-\dfrac{1}{2}\right)\left(1-\dfrac{1}{3}\right)\left(1-\dfrac{1}{4}\right)$

b. $\left(1-\dfrac{1}{2}\right)\left(1-\dfrac{1}{3}\right)\left(1-\dfrac{1}{4}\right)\left(1-\dfrac{1}{5}\right)$

c. $\left(1-\dfrac{1}{2}\right)\left(1-\dfrac{1}{3}\right)\left(1-\dfrac{1}{4}\right)\left(1-\dfrac{1}{5}\right)\left(1-\dfrac{1}{6}\right)$

Write your answers as fractions. Do you see any patterns? Find this product. (there are 99 terms in the product).

d. $\left(1-\dfrac{1}{2}\right)\left(1-\dfrac{1}{3}\right)\left(1-\dfrac{1}{4}\right)..\left(1-\dfrac{1}{99}\right)\left(1-\dfrac{1}{100}\right)$

Can you predict what this product will be?

e. $\left(1-\dfrac{1}{2}\right)\left(1-\dfrac{1}{3}\right)\left(1-\dfrac{1}{4}\right)..\left(1-\dfrac{1}{n-1}\right)\left(1-\dfrac{1}{n}\right)$

Write about the patterns you see in these products.