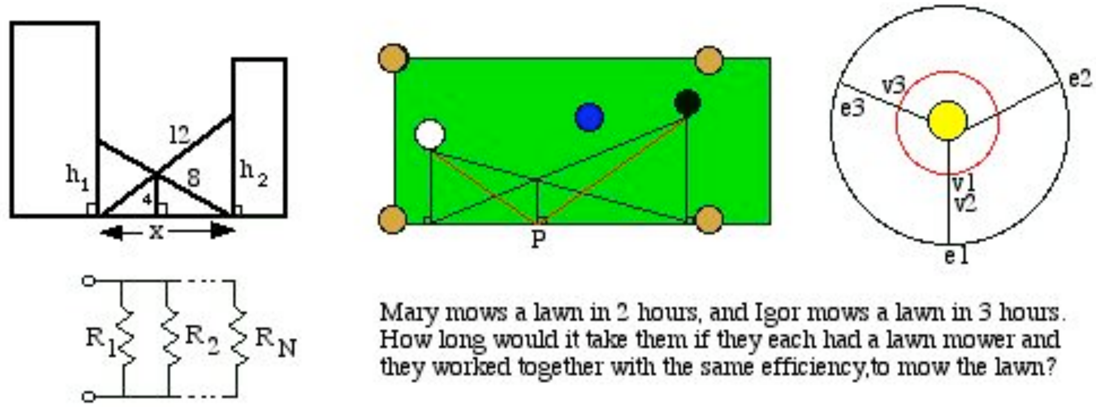
The following five examples appeared to me all in one day of teaching:



(1) The puzzle on the top left is one of my all time favorites. Two boards meet 4 feet above the ground. One board is 12 feet long, the other is 8 feet long, (sorry it's not in metric), and they are leaned up against two buildings in an alleyway. Question, how wide is the alley? In working out this, easily-stated, but difficult question one is soon involved with the rational equation: $\frac{1}{4} = \frac{1}{h_1} + \frac{1}{h_2}$.

(2) In the middle top picture, I have part of a pool table. One must hit the white cue ball so that it strikes the black 8 ball. However, a blue ball is in the way. The following idea I saw in a book by Minnesota Fats on to figure out where to aim to bounce the cue ball off the near side. Draw lines from the cue ball and the 8 ball to the near side. Now put in the cross lines. Where they meet, drop a perpendicular to point "P" in the diagram. Aim at "P", and the ball will follow the red path and strike the target. If you take the red path out of the diagram, do you see that the two diagrams, left and middle top, are the same!

(3) The top right diagram illustrates the sidereal year and the synodic year of Earth (outer ring) and Venus (inner ring) around the sun (Yellow circle). At e_1, v_1, the Earth, Venus and the sun all ine up. At v_2 Venus is back after one circling of the sun (its sidereal year), but Earth has moved to e_2. Venus catches up to Earth at v_3, e_3 when all 3 line up again (synodic year). The equation that links these is: $\frac{1}{P} = \frac{1}{E} + \frac{1}{S}$, where P = sidereal year and E = Earths year (E=1) and S = synodic year. Rational equations again.

(4) On the bottom left, wires are put in series and the total resistance R_T is related to the resistances of the other wires, R_1, R_2, …, R_N by the formula: $\frac{1}{R_t} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots + \frac{1}{R_N}$. There are those rational equations again.

(5) Finally, on the bottom right, if "T" is the final time it takes working together: $\frac{T}{2} + \frac{T}{3} = 1$. More rational equations!

Now to really blow your socks off, I bumped into these 5 examples in five different classes all on the same teaching day. I love it as an example, because it shows that Mathematics can be used in so many different ways.