Fraction Word Problems

68 – With fraction word problems, always make a table showing parts and the whole if needed. Notice that 1/3 more means multiply by 4/3, and ¼ less means multiply by ¾. This can radically simplify a problem as it does in this example. The table looks like

X	Y	Z
4/3 Y	3/4 Z	24

With this done, the answer can be seen by inspection to be 24K.

83 – This may not look like a fraction problem but it has the same format as the above problem.

1	2	T
X+18	X	40

Once the data is in the table it is trivial to see the formula: 2X + 18 = 40.

96 – This one also fits the fraction mold.

	Good Sold	Spoil Sold	Total Cost
Pounds	x-y	y	x
$	s		p

Profit = (x-y)s – xp

Notice that the y is not needed except to subtract from x to get the good product.

134 – This one is a real mouth full. It is all about reading carefully and filling in the table. You will need to a little intermediate algebra as follows:
Ins + Fin = (1/5)18000 = 3600. 4F = 3600, F = 900

F&M	Depr	Ins	Fin	T&L	Total
(1/3)1800 = 6000	(3/5) 12000 = 7200	3F = 2700	F = 900	1200	18000

The financing turns out to be $300 less than the taxes and licenses.

261 – This is really easy once the data is in a table.

A	not A	W
m	x-m	x

The answer is clearly m/(x-m)

264 – This one is a little trickier with an obvious sucker choice. This problem probably should really be in statistics, but the table format works well here.

D	J-N	Year
x	4x	4x+11x

The sucker solution is not to properly weight the eleven months and to write x+4x for the total for the year. X is the average for 11 months.

271 – This is a least integer problem combined with a fraction problem. As with most fraction problems, convert 11/4 to 5/4. Divide 24 by 5/4 and get 24×4/5 = 96/5. Since we want only whole multiples of 5, decrease 96 until you get a multiple of 5, which is 95. Since 95 is one multiple of 5 less than 100, the value is 19.

275 – This is a good example of the book showing a brut force approach which is way to long. Begin by writing down 1/2, and place the other numbers relative to it. You can get your time down to 20 seconds with this method.

288 – This one is confusing, and the book doesn't help. You really need the table here with separate rows for capacity and percent full.

	x	y
Capacity	x	y = 2x
% full	x/2	2/3 = 4x/3

When x is poured into y, y has an amount $\frac{x}{2}+\frac{4x}{3}=\frac{11x}{6}$, but y = x/2 so y is 11/12 full.

296 – This is tedious and can take a long time. It is a combination of percents, fractions, and tiered compensation. The key is to see the structure fast, and a table is big help. Here is my first pass at a table, but even this can be improved upon. Notice that it is easy to work in units of a 1000 than to carry all the zeros in your computations.

20H	40H	50H
30%	50%	20%
300	500	200
$5	$5	$5(40)+(15/2)(10)
20×5×300	40×5×500	40×5×200+75×200
30K	100K	40K+15K

An improved table simplifies the picture by adding one more column to separate the tired compensation. It also takes the simplification to units of the thousand one more level by regrouping the zeros to make it easier to the 1000's. Of course, this can be done mentally.

20H	40H	40H	10H
30%	50%	20%	
300	500	200	
\$5	\$5	\$5	\$7.5
20×5×300	40×5×500	40×5×200	10×7.5×200
2×5×3K	4×5×5K	4×5×2K	7.5×2K
30K	100K	40K	15K