1

Question: is $\frac{x}{100}*\frac{x}{100}*y=y(1-\frac{x}{100})$? --> is $x^2y=100y(100-x)$? --> is $x^2y=y(10,000-100x)$ --> is $y(x^2+100x-10,000)=0$?

Basically question is $y=0$ or/and $x^2+100x-10,000=0$?

(1) $x(x+100)=10,000$ --> $x^2+100x-10,000=0$. Directly gives the answer. Sufficient.

(2) $y(y+1)=1$. Here it's clear that $y\neq0$, (substitute $y=0$ in this equation: $0(0+1)=0\neq1$). So we know that $y\neq0$, but don't know whether $x^2+100x-10,000=0$? Not sufficient.

Answer: A.

2

Jack and Mark both received hourly wage increases of 6 percent. After the increases, Jack' hourly wage was how many dollars per hour more than Mark's?

(1) Before the wage increases, Jack's hourly wage is $5 per hour more than Mark's --> no need for algebra here: as wages increase by 6% then the difference between them also increases by the same 6% --> new difference 5*1.06. Sufficient.

(2) Before the wage increases, the ratio of the Jack's hourly wage to Mark's hourly wage is 4 to 3 --> just ratio is not enough to get the value of new difference, as for different hourly wages we'll get different result: bigger the wages the bigger the difference will be. Not sufficient.

Answer: A.

3

Let the selling price and cost price of an armchair be S_a and C_a respectively;
Let the selling price and cost price of a coffee table be S_c and C_c respectively.
Basically we need to get: $\frac{S_a-C_a}{S_c-C_c}$.

(1) Martha paid 10% more for armchair than for the coffee table --> $C_a=1.1*C_c$. Not sufficient to get the ratio.

(2) Martha sold the armchair for 20% more than she sold the coffee table --> $S_a=1.2*S_c$. Not sufficient to get the ratio.

(1)+(2) $\frac{S_a-C_a}{S_c-C_c}=\frac{1.2*S_c-1.1*C_c}{S_c-C_c}$, still not sufficient to get the ratio.

Answer: E.

Notice though that if the percents in (1) and (2) were the same then the answer would be C, since we would be able to factor out the percent and then reduce by S_c-C_c. For example if (1) were *Martha paid 20% more for armchair than for the coffee table*, then we would have: $\frac{S_a-C_a}{S_c-C_c}=\frac{1.2*S_c-1.2*C_c}{S_c-C_c}=\frac{1.2*(S_c-C_c)}{S_c-C_c}=1.2$, which would mean that Martha's gross profit from the armchair was 20% greater than her gross profit from the coffee table. Or simply if both the cost price and selling price of the armchair were 20% greater than the cost price and selling price of the coffee table then the profit would also be 20% greater.

4

A certain salesman's yearly income is determined by a base salary plus a commission on the sales he makes during the year. Did the salesman's base salary account for more than half of the salesman's yearly income last year?

Given: **{Income}={salary}+{commission}**. Question basically asks: is **{salary}>{commission}**?

(1) If the amount of the commission had been 30 percent higher, the salesman's income would have been 10 percent higher last year --

> **1.1({salary}+{commission})={salary}+1.3{commission}** --> **{salary}=2{commission}** --> **{salary}>{commission}**. Sufficient.

(2) The difference between the amount of the salesman's base salary and the amount of the commission was equal to 50 percent of the salesman's base salary last year --> **|{salary}-{commission}|=0.5{salary}**, notice that {salary}-{commission} is in absolute value sign ||, meaning that we can have two cases:

A. **{salary}-{commission}=0.5{salary}** --> **0.5{salary}={commission}** --> **{salary}>{commission}**, thus the answer would be YES;
Or:
A. **{commission}-{salary}=0.5{salary}** --> **1.5{salary}={commission}** --> **{salary}<{commission}**, thus the answer would be No.
Not sufficient.

Answer: A.

5

Whenever Sally takes a cab and the fare is between $15 and $65, she calculates the dollar amount of the tip as 3 times the tens digit of the fare. If Sally's most recent fare was between $15 and $65, was the tip Sally calculated on this bill greater than 25 percent of the amount of the bill?

You can solve this question with algebra but I think simple analysis would be better.

(1) The amount of the fare was between $17 and $40 --> 17<fare<40. Now if the fair was 20$ then the tip would be 3*2=$6 (3 times tens digit) so more than 0.25*20=$5 (25% of the fare) but if the fare was 28$ then the tip would still be 3*2=$6 but in this case less than 0.25*28=$7. Not sufficient.

(2) Sally calculated a tip of $3 --> tip=$3 means that: 15<fare<20 (so that the tens digit of the fare to be 1). Now, even if the fare was exactly $15 (lowest limit), 25% of it would be 0.25*15=$3.75 and it's still greater than $3. So the answer to the question is NO: the tip (3$) was not greater than 25% of the fare. Sufficient.

Answer: B.