1

Material A costs $3 per kilogram, and material B costs $5 per kilogram. If 10 kilograms of material K consists of x kilograms of material A and y kilograms of material B, is x >y?

Given: x+y=10. Question: is x>y?

(1) y > 4. Clearly insufficient: if y=4.5<x=5.5 the answer will be YES but if y=6>x=4 the answer will be NO.

(2) The cost of the 10 kilograms of material K is less than $40 ---> 3x+5y<40, as y=10-x then: 3x+5(10-x)<40 --> 2x>10 --> x>5, so x>y. Sufficient.

Answer: B.

2

Set the equation: $0.1x+0.02y=0.05(x+y)$, where $x+y=z$ --> $5x=3y$ --> Q: $x=?$

(1) $y=10$ --> $5x=3y=30$ --> $x=6$. Sufficient.

(2) $z=x+y=16$ --> $y=16-x$ --> $5x=3y=3(16-x)$ --> $x=6$. Sufficient.

Answer: D.

3

(1) Solution 1 contains water and milk in the ratio 1:9 and Solution 2 contains water and milk in the ratio 2:3

Given: $\frac{w_1}{m_1}=\frac{x}{9x}$ and $\frac{w_2}{m_2}=\frac{2y}{3y}$, for some multiples x and y.

We want $\frac{x+2y}{9x+3y}=\frac{3}{7}$. Question: $\frac{x+9x}{2y+3y}=\frac{2x}{y}=?$

From first equation we can express x in terms of y (or vise versa) substitute it in the second and get desired ratio: $\frac{x+2y}{9x+3y}=\frac{3}{7}$ --> $y=4x$ --> $\frac{2x}{y}=\frac{2x}{4x}=\frac{1}{2}$. Sufficient.

(2) The amount of milk in 100 gallon of solution 1 is 80 gallaons more than that of water in teh same solulution. Further, 50 gallons of Solution 2 contains 10 gallons more milk than water.

Given: $w_1+m_1=100$ and $w_1+80=m_1$ ---> $w_1=10$ and $m_1=90$ --> $\frac{w_1}{m_1}=\frac{x}{9x}$;

$w_2+m_2=50$ and $w_2+10=m_2$ ---> $w_2=20$ and $m_1=30$ --> $\frac{w_2}{m_2}=\frac{2y}{3y}$;

The same info as in (1). Sufficient.

Answer: D.

4

One kilogram of a certain coffee blend consists of x kilogram of type I coffee and y kilogram of type II coffee. The cost of the blend is C dollars per kilogram, where C = 6.5x + 8.5y. Is x < 0.8?

"**One kilogram** of a certain coffee blend consists of x kilogram of type I coffee and y kilogram of type II coffee"

So, $x+y=1$. Question: is $x<0.8$.

(1) y > 0.15 --> $1-x>0.15$ --> $x<0.85$. Not sufficient.

(2) C >=7.30 --> $C=6.5x+8.5y\geq 7.3$ --> $C=6.5x+8.5(1-x)\geq 7.3$ --> $2x\leq 1.2$ --> $x\leq 0.6$.
Sufficient.

Answer: B.

5

Food -- Number of Calories per Kilogram -- Number of Grams of Protein per Kilogram
S ----- 2.000 ----------150
T ----- 1,500 ----------90

The table above gives the number of calories and grams of protein per kilogram of foods S and T. If a total of 7 kilograms of S and T are combined to make a certain food mixture, how many kilograms of food S are in the mixture?

(1) The mixture has a total of 12,000 calories --> say x kilograms of food S are in the mixture then there will be 7-x kilograms of food T in the mixture. Now, according to the table above we'll have: 2,000x+1,500(7-x)=12,000, since there is only one variable then we can solve for it. Sufficient.

(2) The mixture has a total of 810 grams of protein --> 150x+90(7-x)=810, since there is only one variable then we can solve for it. Sufficient.

Answer: D.

OR

S -> 2000 C/kg and 150 P/kg
T -> 1500 C/kg and 90 P/kg

The mixture of the two is 7 kg.

Statement 1:
Mixture has 12000 C i.e. 12000/7 C/kg

The average calorie content of the mixture is 12000/7.

wT/wS = (AS - Aavg)/(Aavg - AT) (this formula represents the scale. You can either use the number line or this formula)

wT/wS = (2000 - 12000/7)/(12000/7 - 1500) = 2000/1500 = 4/3
So, in 7 kg, T was 4 kg and S was 3 kg

You don't really need to solve it. From the data you see that you have calorie content of each food and the average calorie content, so you can easily find the ratio of each food in the mixture. You also have the amount of mixture so you can easily find the amount of each food in the mixture.

Statement 2:
Mixture has 810 gms of P i.e. 810/7 P/kg

wT/wS = (150 - 810/7)/(810/7 - 90)

Again, same process as above.