

1

In a certain building, $\frac{1}{5}$ of the offices have both a window and bookshelves. If the rest of the offices in the building have either a window or bookshelves but not both, what is the ratio of the number of offices with a window but not bookshelves to the number of offices with bookshelves but not a window?

Say there are total of 300 offices. Then given that:

	Bookshelves	No bookshelves	TOTAL
Window	60		
No window		0	
TOTAL			300

We need to find the ratio of the yellow boxes.

(1) The number of offices with a window is $\frac{4}{5}$ the number with bookshelves. Say the number of the offices with bookshelves is x and the number of the offices with a window is $\frac{4}{5}x$. Then the number of the offices with bookshelves but not a window is $x-60$. Also, the total number of the offices with no window is $x-60$. Thus, $\frac{4}{5}x + (x-60) = 300$. We can find x , thus we can find the value of the yellow boxes. Sufficient.

	Bookshelves	No bookshelves	TOTAL
Window	60	$\frac{4}{5}x-60$	$\frac{4}{5}x$
No window	$x-60$	0	$x-60$
TOTAL	x		300

(2) $\frac{3}{10}$ of the offices with bookshelves also have a window. Again, say the number of the offices with bookshelves is x , then we are given that $60 = \frac{3}{10}x$. We can find x (200), thus we can find the number of the offices with both a window and bookshelves ($\frac{3}{10}x = 60$) and then find the number of the offices with bookshelves but not a window ($200-60=140$). Also, we can find the total number of the offices with no bookshelves ($300-200=100$), which is the same as the number of the offices with a window but no bookshelves. So, we have the values of both yellow boxes. Sufficient.

	Bookshelves	No bookshelves	TOTAL
Window	$60 = \frac{3}{10}x$	100	
No window	140	0	
TOTAL	$x=200$	100	300

Answer: D.

2

In Washington School, 150 students study physics or biology or both. If 60 of these students do not study biology, how many of these students study both physics and biology?

"150 students study physics or biology or both" means: $150 = \{\text{physics}\} + \{\text{biology}\} - \{\text{both}\}$, we subtract $\{\text{both}\}$ (students who study both physics or biology) since its counted in $\{\text{physics}\}$ as well as in $\{\text{biology}\}$.

"60 of these students do not study biology" means: $60 = \{\text{physics}\} - \{\text{both}\}$ (so 60 study ONLY physics) --> $150 = 60 + \{\text{biology}\}$ (from above) --> $\{\text{biology}\} = 90$.

Question: $\{\text{both}\} = ?$

(1) Of the 150 students, 40 do not study physics --> $40 = \{\text{biology}\} - \{\text{both}\}$ --> $40 = 90 - \{\text{both}\}$ --> $\{\text{both}\} = 50$. Sufficient.

(2) A total of 110 of the students study physics --> $\{\text{physics}\} = 110$, so from $60 = \{\text{physics}\} - \{\text{both}\}$ --> $\{\text{both}\} = 50$. Sufficient.

Answer: D.

3

Each member of a pack of 55 wolves has either brown or blue eyes and either a white or a grey coat. If there are more than 3 blue-eyed wolves with white coats, are there more blue-eyed wolves than brown-eyed wolves?

Look at the matrix below:

	Brown eyes	Blue eyes	TOTAL
White coats		>3	
Grey coats			
TOTAL			55

"There are more than 3 blue-eyed wolves with white coats" means that # of wolves which have blue eyes AND white coats is more than 3. The question asks whether there are more blue-eyed wolves (blue box) than brown-eyed wolves (brown box).

- (1) Among the blue-eyed wolves, the ratio of grey coats to white coats is 4 to 3. Not sufficient on its own.
(2) Among the brown-eyed wolves, the ratio of white coats to grey coats is 2 to 1. Not sufficient on its own.

(1)+(2) When taken together we get the following matrix:

	Brown eyes	Blue eyes	TOTAL
White coats	2y	3x>3	
Grey coats	y	4x	
TOTAL	3y	7x	55

Notice that x and y must be integers (they represent some positive multiples for the ratios given in the statements).

So, we have that $3y+7x=55$. After some trial and error we can find that this equation has only 3 positive integers solutions:

$y=2$ and $x=7 \rightarrow 3y+7x=6+49=55$;
 $y=9$ and $x=4 \rightarrow 3y+7x=27+28=55$;
 $y=16$ and $x=1 \rightarrow 3y+7x=48+7=55$;

Now, the third solution ($x=1$) is not valid, since in this case # of wolves which have blue eyes AND white coats becomes $3x=3$, so not more than 3 as given in the stem. As for the first two cases, in both of them $7x$ is more than $3y$ ($49>6$ and $28>27$), so we can answer definite YES, to the question whether there are more blue-eyed wolves (blue box) than brown-eyed wolves (brown box).

Answer: C.

4

(1) Of the students who do not own a car, 14 are male. Clearly insufficient.

(2) Of the students who own a car, 42% are female \rightarrow let # of students who own a car be $x \rightarrow 0.42x = \#$ of females who own a car.

But $0.42x$ must be an integer, as it represent # of females. $0.42x = \text{integer} \rightarrow \frac{21}{50}x = \text{integer} \rightarrow x$ is a multiple of 50: 50, 100, 150, ... But x (# of students who own car) must also be less than (or equal to) 80. So $x = 50$. sufficient.

Answer: B.

5

Each first-year student at a certain school selects either the traditional curriculum or the modern curriculum. Of the first-year students at the school, 65 percent selected the modern curriculum and the rest selected the traditional curriculum. What percent of the first-year students are female?

(1) Twice as many female first-year students selected the modern curriculum than selected the traditional curriculum:

	Traditional	Modern	TOTAL
Female	x	2x	3x=?
TOTAL	35	65	100

Not sufficient.

(2) Of the first-year students who selected the traditional curriculum, 55 percent are female:

	Traditional	Modern	TOTAL
Female	$0.55 * 35 = 19.25$?
TOTAL	35	65	100

Not sufficient.

(1)+(2) As you can see x from (1) equals to 19.25 from (2), so 3x (percent of the female students) equals to $3 * 19.25 = 57.75\%$. Sufficient.

Answer: C.

6

Actually we do not assume that. All sweaters in the world are either wool or NOT wool (any other material). Look at either of the diagrams below, there is a row saying "Not Wool", so all sweater out of 800 which are made of some other material than wool are distributed there.

Of the 800 sweaters in a certain store, 150 are red. How many of the red sweaters at the store are made of pure wool?

(1) 320 of the sweaters at the store are neither red nor made of pool wool:

(1)	Red	Not Red	TOTAL
Wool	?	330	
Not Wool		320	
TOTAL	150	650	800

Not sufficient to get # of red sweaters made of pure wool (yellow box).

(2) 100 of the red sweaters at the store are not made of pure wool:

(2)	Red	Not Red	TOTAL
Wool	$= 150 - 100 = 50$		
Not Wool	100		
TOTAL	150		800

As you can see, # of red sweaters made of pure wool (yellow box) is $150 - 100 = 50$. Sufficient.

Answer: B.

Are at least 80 percent of the people in Country X who are 25 years old or younger full-time students?

Question asks whether 80% of *some particular group* are students.

(1) In Country X, 32 percent of the population is 25 years old or younger. We are given the size of this particular group. Not sufficient.

(2) In Country X, of the population 25 years old or younger, 90 percent of the women and 75 percent of the men are full-time students. *Of this particular group* 90% of the women and 75% of the men are students --> since **the weighted average of 2 individual averages (90% and 75%) must lie between these individual averages**, then the average percent of students in this particular group is between 75% and 90%, so it may or may not be more than 80%. Not sufficient.

(1)+(2) Nothing new. Not sufficient.

Answer: E.