1

Let's # of students at Social High be 8 (I picked 8 as in this case 3/8 of total and 5/8 of total will be an integer).

3/8 of all students at Social High are in all three clubs --> 3/8*8=3 people are in exactly 3 clubs;

1/2 of all students are in Albanian club --> 1/2*8=4 people are in Albanian club;
5/8 of all students are in Bardic club --> 5/8*8=5 people are in Bardic club;
3/4 of all students are in Checkmate club --> 3/4*8=6 people are in Checkmate club;

Also as every student is in at least one club then # of students in neither of clubs is 0;

Total=A+B+C-{# of students in exactly 2 clubs}-2*{# of students in exactly 3 clubs}+{# of students in neither of clubs};

8=4+5+6-{# of students in exactly 2 clubs}-2*3+0 --> **{# of students in exactly 2 clubs}=1**, so fraction is 1/8.

Answer: A.

2

Notice that "7 play both Hockey and Cricket" does not mean that out of those 7, some does not play Football too. The same for Cricket/Football and Hockey/Football.

{Total}={Hockey}+{Cricket}+{Football}-{HC+CH+HF}+{All three}+{Neither} For more check ADVANCED OVERLAPPING SETS PROBLEMS

50=20+15+11-(7+4+5)+{All three}+18 --> {All three}=2;

Those who play ONLY Hockey and Cricket are 7-2=5;
Those who play ONLY Cricket and Football are 4-2=2;
Those who play ONLY Hockey and Football are 5-2=3;

Hence, 5+2+3=10 students play exactly two of these sports.

Answer: B.

3

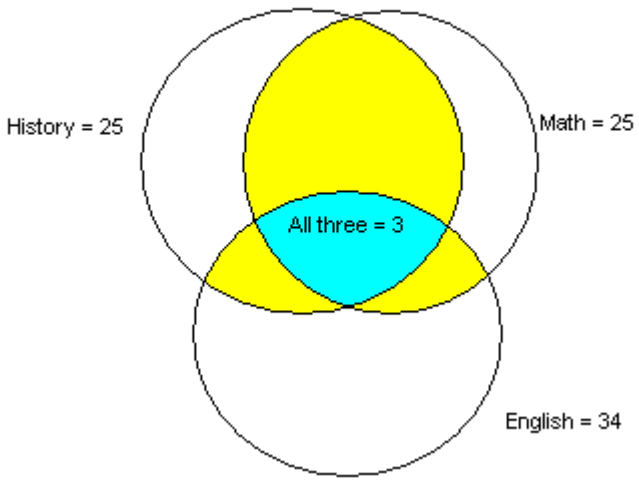
"Each student is registered for **at least one of three classes**" means that **there are no students who are registered for none of the classes.**

Total = {people in group A} + {people in group B} + {people in group C} - {people in exactly 2 groups} - 2*{people in exactly 3 groups} + {people in none of the groups}:

68 = 25 + 25 + 34 - {people in exactly 2 groups} - 2*3 + 0 --> **{people in exactly 2 groups}=10**

Answer: B.

Look at the diagram:



We need to find {people in exactly 2 groups}, so yellow section. Now, when we sum {people in group A} + {people in group B} + {people in group C} we count students who are in exactly 2 groups (yellow section) **twice**, so to get rid of double counting we are subtracting **{people in exactly 2 groups}** once.

Similarly when we sum {people in group A} + {people in group B} + {people in group C} we count students who are in exactly 3 groups (blue section) **thrice** (as it is the portion of all three groups), so to count this group only once we are subtracting **2*{people in exactly 3 groups}**.

4

Say x% of the employees own laptops. Since "the number of employees without laptops is 40% less than the employees with laptops", then $100-x=0.6*x$ --> $x=62.5$, so **62.5% of the employees own laptops**.

Next:
"44% of the employees that own laptops do not own cellphone", so 56% of the employees that own laptops own cellphone, so own both laptops and cellphone --> 0.56*62.5={Both}.

"30% of the employees that own cellphone do not own laptops", so 70% of the employees that own cellphone own laptops, so own both laptops and cellphone --> 0.7*y={Both}, where y is percentage of the employees who own cellphone.

From above: 0.56*62.5=0.7*y --> y=50 and {Both}=0.7*y=35, so **50% of the employees own cellphone** and **35% of the employees own both laptops and cellphone**.

{Total}={Laptops}+{Cellphone}-{Both}+{Neither} --> **100=62.5+50-35+{Neither}** --> **{Neither}=22.5%.**

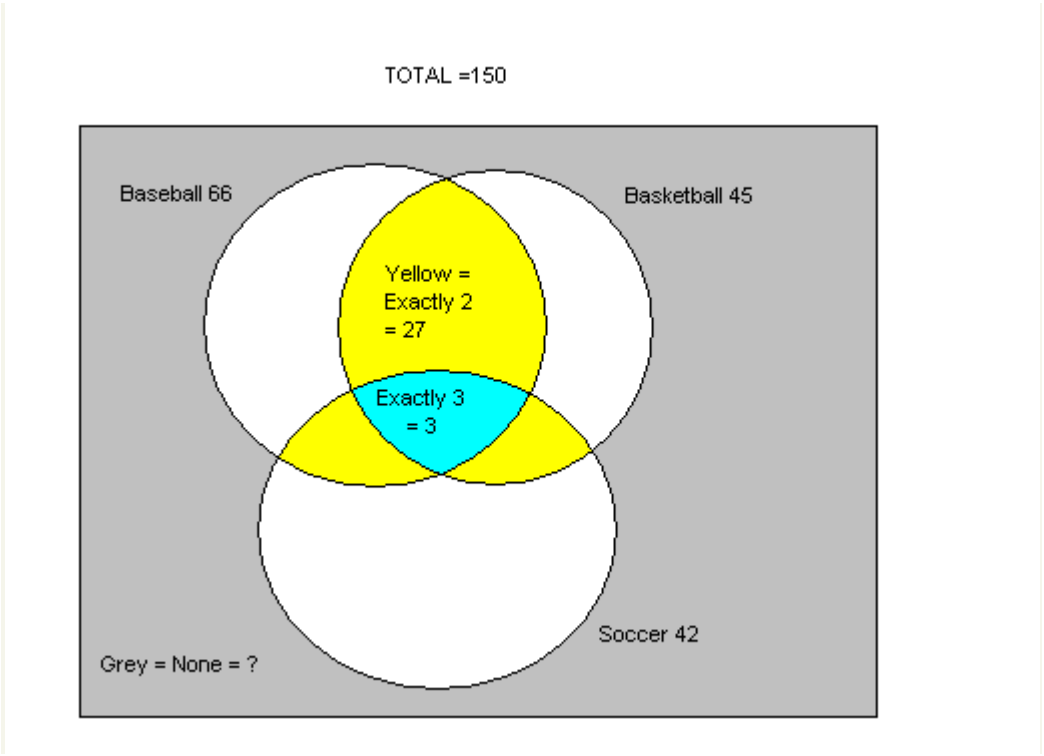
Answer: B.

5

150 = {baseball} + {basketball} + {soccer} - {exactly 2 sports} - 2*{exactly 3 sports} + {none of the ports}:

150 = 66 + 45 + 42 - 27 - 2*3 + {none of the ports} --> **{none of the ports}=30**

Answer: C.



When we sum {baseball} + {basketball} + {soccer} we count students who play exactly 2 ports (yellow section) **twice**, so to get rid of double counting we are subtracting **{exactly 2 sports}** once.

Similarly when we sum {baseball} + {basketball} + {soccer} we count students who play exactly 3 ports (blue section) **thrice** (as it is the portion of all three groups), so to count this group only once we are subtracting **2*{exactly 3 sports}**.

6