Tour de Clochemerle

Variables

5 Riders: Arouet=A

Barthes=B

Camus=C

Diderot=D

Eluard=E

Places: 1st =5pts

2nd =4pts

3rd =3pts

4th =2pts

5th =1pts

Given Information

	A	B	C	D	E
Stage 1					
Stage 2					
Stage 3					
Stage 4					3pts
Stage 5					8pts
Total	24pts				11pts

From this we can see that E scores 8 points over stages 4 and 5 combined. As the minimum score per stage is 1 point, this means his minimum score over stages 1, 2 and 3 combined is 3 points. Therefore, his minimum total score would be 11pts.

Total pts available = 75pts

As we know, all the riders finish on different total scores and finish in alphabetical order (ABCDE).

If we said that E scored 12 pts overall, this means the lowest total score for D is 13pts, the lowest total score for C is 14 pts, the lowest total score for B is 15 pts, and the question says that A scores 24 pts.

12+13+14+15+24=78 78>75 so it is impossible for E to score 12 or more pts in total.

Whereas, if E scores 11pts total then:

11+12+13+14+24=74 74<75 so this is possible, meaning 11 pts is the maximum value E can score in total.

As 11pts is both the maximum and minimum score for E in total, this means E must have scored 11pts overall.

So, as E scores 11pts this means he scores 1 pts in each of the first stages.

A total score = 24pts

From this we see the only available combo is four wins and one 2nd place (5+5+5+5+4=24). As E wins the last stage, this means that A wins stages1-4 and comes 2nd in stage 5.

	A	B	C	D	E
Stage 1	5pts				1pts
Stage 2	5pts				1pts
Stage 3	5pts				1pts
Stage 4	5pts				3pts
Stage 5	4pts				5pts
Total	24pts				11pts

Total pts available = 75 pts

Total score of B + C + D = 75-24-11 = 40pts

As the riders finished in order ABCDE, none scored the same score, and pts can be scored as integers:

$12 \leq D < C < B \leq 23$

$\therefore 12 \leq D \leq 21 \quad 13 \leq C \leq 22 \quad 14 \leq B \leq 23$

C finishes in the same position in 4 out of 5 races. This means that in these 4 races he scores either 4x2= 8pts, 4x3= 12pts, 4x4= 16pts. It is impossible for him to finish 1st four times as A finishes first in four out of 5 races; or for him to finish 5th four times as E finishes fifth in three out of five races.

We can deduce that it is impossible for him to finish 4th four times as this would leave him on 8 points meaning that he would have to score 5 pts to get the minimum total of 13 pts required, but this is impossible as A finishes 1st in four out of five races and E wins in the other, meaning that C never wins.

We can deduce that it is impossible for him to finish 2nd four times as this would leave him on 16pts pts, however as B>C this means that B would score a minimum of 17 pts in total.

$\therefore B+C = 16+17 = 33$pts

As B+C+D= 40pts, this means that D would finish on a total of 40-33=7pts.

But this is impossible as $D \geq 12$

$\therefore$ C finishes 3rd four times.

As E finishes 3rd in stage 4, this means that C finishes 3rd on stages 1, 2 ,3 and 5.

	A	B	C	D	E
Stage 1	5pts		3pts		1pts
Stage 2	5pts		3pts		1pts
Stage 3	5pts		3pts		1pts
Stage 4	5pts				3pts
Stage 5	4pts		3pts		5pts
Total	24pts				11pts

As C finishes 3rd four times, the maximum pts he can score is 4x3+4=16pts (cannot finish 1st place) and the minimum is 12+1 = 13pts.

∴ The maximum total for D is 15pts.

∴ 12≤D≤15 13≤C≤16 14≤B≤23

Total pts left = 75-24-11-4x3 = 28 pts

If B and D score their minimum total scores (12+14=26) then C scores 2pts (28-26=2) in stage 4.

∴ 13≤C≤14

If C= 14 ⇒ B=14 D=12 This is impossible as B≠C

∴ C= 13 ⇒ B=14 D=13 This is impossible as D≠C

or

B=15 D=12 This works as A≠B≠C≠D≠E

∴ C scores 1 pts in stage 4 **and** **A=24**

B=15

C=13

D=12

E=11

	A	B	C	D	E
Stage 1	5pts		3pts		1pts
Stage 2	5pts		3pts		1pts
Stage 3	5pts		3pts		1pts
Stage 4	5pts		1pts		3pts
Stage 5	4pts		3pts		5pts
Total	24pts	15pts	13pts	12pts	11pts

Positions left – 4x 2nd place

5x 4th place

1x 5th place

As B finishes on 15 pts, an odd number, this means that he must have finishes in an odd numbered position (1st, 3rd, 5th) an odd number amount of times.

As the only available odd numbered points placing is the 5th place on stage 5, **this means that B finishes 5th on stage 5.**

	A	B	C	D	E
Stage 1	5pts		3pts		1pts
Stage 2	5pts		3pts		1pts
Stage 3	5pts		3pts		1pts
Stage 4	5pts		1pts		3pts
Stage 5	4pts	1pts	3pts		5pts
Total	24pts	15pts	13pts	12pts	11pts

In conclusion, using deduction, I have proved that Eluard must finish on 11pts in total, that Barthes must finish 5th on stage 5 and that Barthes finishes on 15pts in total, Camus finishes on 13pts in total and Diderot finishes on 12 pts in total.