

STEP II, 2022, Q9 EC

Question 9

Many of the attempts at this question failed to achieve good marks. Some candidates struggled to convert the text into a suitable diagram, while others were confused about whether to label the forces that other objects exerted on the plank or the forces exerted by the plank itself. These diagrams then often led to confusion about the directions of the forces in play.

In part (i) there were many attempts that used backwards logic – assuming that there was no frictional force and finding the value of x required for this to be true. There were also a number of candidates who assumed that the frictional force would always be equal to μN , rather than taking this as the maximum.

Part (ii) was often done poorly because it was often not clear that the solution was using the magnitudes of the forces when using $F = \mu N$.

In part (iii) candidates often failed to consider all possible cases for the value of x and it was common to see the first result shown in one of the cases and the second result shown in the other.

Solutions to part (iv) were more successful from the candidates who reached this point.



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