STEP II, 2002, Q10

10 A competitor in a Marathon of $42\frac{3}{8}$ km runs the first t hours of the race at a constant speed of 13 km h^{-1} and the remainder at a constant speed of $14 + 2t/T$ km h^{-1}, where T hours is her time for the race. Show that the minimum possible value of T over all possible values of t is 3.

The speed of another competitor decreases linearly with respect to time from 16 km h^{-1} at the start of the race. If both of these competitors have a run time of 3 hours, find the maximum distance between them at any stage of the race.

NextStepMaths.com

To view mark schemes, fully worked solutions and examiner's comments, and for more details about tutoring and other services offered, go to NextStepMaths.com

NextStepMaths.com

To view mark schemes, fully worked solutions and examiner's comments, and for more details about tutoring and other services offered, go to NextStepMaths.com