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4. A girl runs a 400 m race in a time of 84 s. In a model of this race, it is assumed that, starting from rest, she moves with constant acceleration for 4 s, reaching a speed of  $5 \text{ m s}^{-1}$ . She maintains this speed for 60 s and then moves with constant deceleration for 20 s, crossing the finishing line with a speed of  $V \text{ m s}^{-1}$ .
- (a) Sketch, in the space below, a speed-time graph for the motion of the girl during the whole race. (2)
- (b) Find the distance run by the girl in the first 64 s of the race. (3)
- (c) Find the value of  $V$ . (5)
- (d) Find the deceleration of the girl in the final 20 s of her race. (2)

















