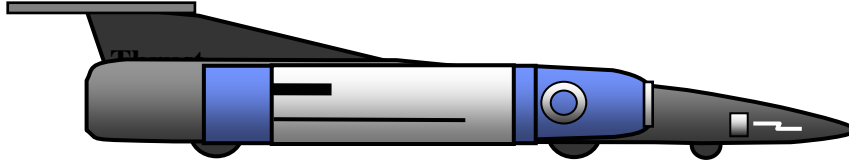
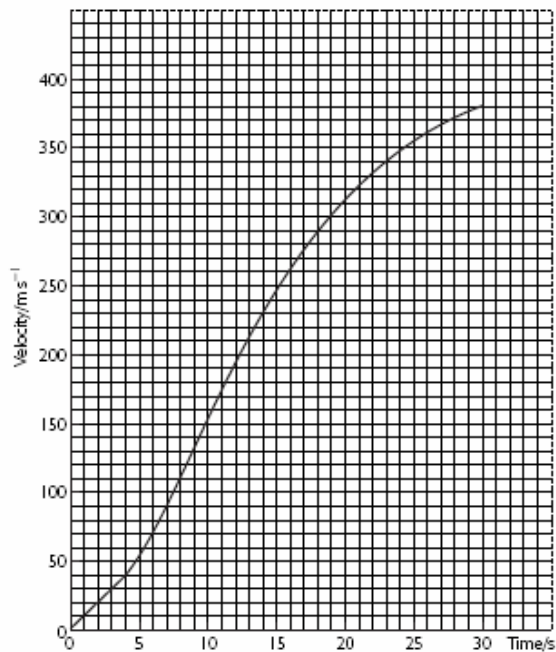


TAP 206- 5: Thrust SSC

1. In 1997 Thrust SSC was driven to a supersonic world record speed of 771 mph (peak) and 767 mph (mile average) (about 334 m s^{-1} and 332 m s^{-1}).



In their research the Thrust SSC Development Team predicted that the car's velocity would initially increase as shown in the graph below.



- (a) Describe *in words only* (no numerical values) the predicted acceleration
- during the first 4 seconds,
 - from 4 s to 30 s.
- (b) Use the graph to predict the size of the acceleration at 12 s.
- (c) Use the same graph to predict the car's displacement after 10 s.

Answers and worked solutions

1

(a) (i) Uniform acceleration

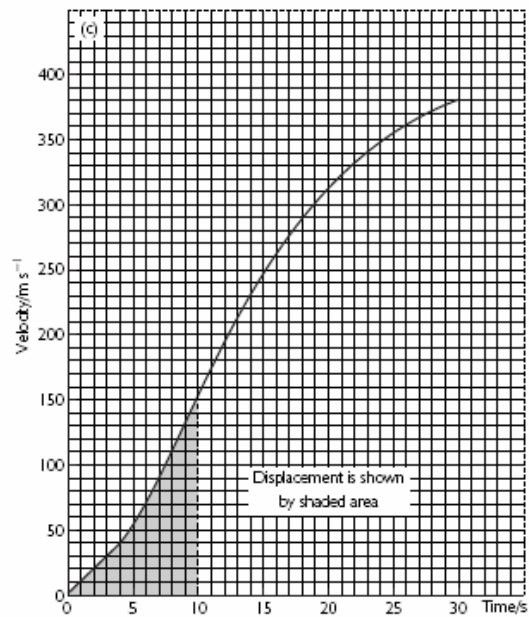
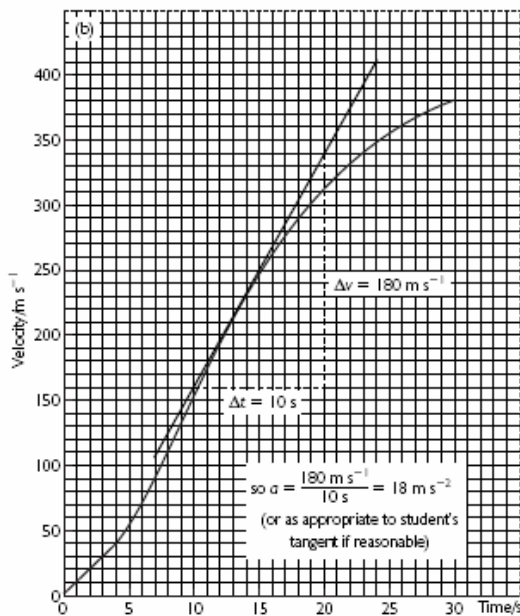
(ii) Non-uniform acceleration

After 4 s, acceleration first increases (slightly) then decreases.

(NB NO deceleration, acceleration does NOT become negative)

(b) $a = \Delta v / \Delta t = 180 \text{ m s}^{-1} / 10 \text{ s}$

(or similar values read from tangent to graph) = 18.0 m s^{-2}



(c) 100 small squares represent 1000 m area under graph is about 62 small squares so displacement is about $1000 \text{ m} \times 62/100 = 620 \text{ m}$ (or similar value deduced from area of graph)

External references

This activity is taken from Salters Horners Advanced Physics, AS, Section Higher, Faster, Stronger, HFS, Additional Activity 6.