

- 1 Fig. 1.1 shows a bomber flying horizontally at a speed of 72 m s^{-1} and at a height of 100 m above the ground. When directly flying over the origin O, bomb B is released and it strikes a truck T, which is moving along a level road with a constant speed v . At the instant the bomb is released, the truck T is at a distance $x_0 = 125 \text{ m}$ from origin O.

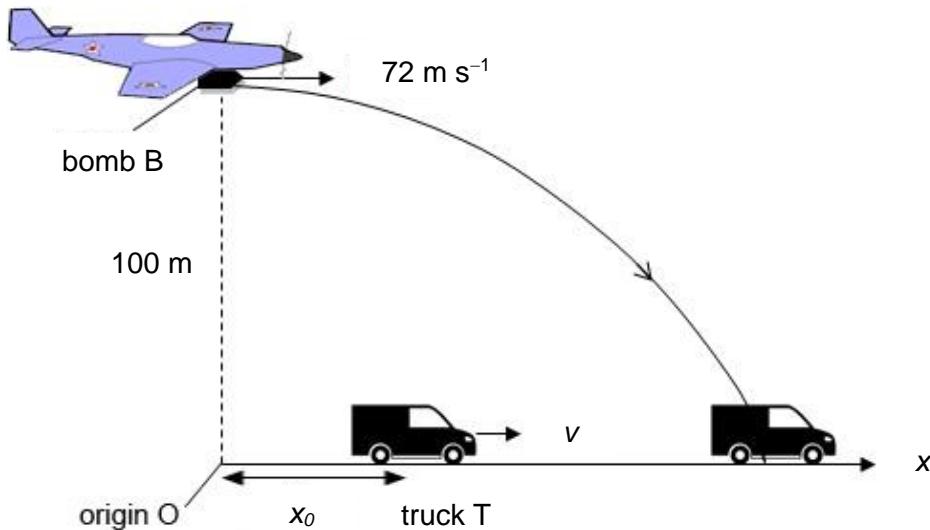


Fig. 1.1

- (a) The trajectory of bomb B after it is released from the bomber is said to be *parabolic*. Explain qualitatively why the path taken is *parabolic*.

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.....
..... [2]

- (b) Calculate the time of flight of bomb B upon striking the truck T.

$$\text{time of flight} = \dots \text{ s} [2]$$

- (c) (i) On Fig. 1.2, sketch graphs showing the variation with time t of the horizontal displacement x , for the bomb B and the truck T. Label the graphs B and T respectively, indicating appropriate values on the graphs.



Fig. 1.2

[2]

- (ii) Use your graphs in (c)(i) or otherwise, determine the speed v of the truck T.

$$v = \dots \text{ m s}^{-1} [2]$$

[Total: 8]