

STEP II, 2005, Q10

- 10 The points A and B are 180 metres apart and lie on horizontal ground. A missile is launched from A at speed of 100 m s^{-1} and at an acute angle of elevation to the line AB of $\arcsin \frac{3}{5}$. A time T seconds later, an anti-missile missile is launched from B , at speed of 200 m s^{-1} and at an acute angle of elevation to the line BA of $\arcsin \frac{4}{5}$. The motion of both missiles takes place in the vertical plane containing A and B , and the missiles collide.

Taking $g = 10 \text{ m s}^{-2}$ and ignoring air resistance, find T .

[Note that $\arcsin \frac{3}{5}$ is another notation for $\sin^{-1} \frac{3}{5}$.]



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