Answer on Question #53162, Physics / Other

Question:

Car A is travelling at 22.0 m/s and car B at 29.0 m/s. Car A is 300 m behind Car B when the drive of car A accelerates his car with an acceleration of2.4 m/s2. How long does it take Car A to overtake Car B?

Answer:

Coordinate of car A equals:

$$x_A = 22t + 2.4\frac{t^2}{2}$$

Coordinate of car B equals:

$$x_B = 300 + 29t$$

Car A is overtake car B when $x_A = x_B$:

$$22t + 2.4\frac{t^2}{2} = 300 + 29t$$

$$1.2t^2 - 7t - 300 = 0$$

$$t = 19.0\ s$$

Answer: $t = 19.0\ s$