@title Speed of a Train

@description Determine the original speed of a train given a change in travel time when speed changes.

@question A train travels from Station A to Station B at a constant speed. If it had been 10 km/h faster, it would have taken 36 minutes less to cover the journey. If the length of the journey is 120 km, what is the speed of the train?

@instruction Choose the correct speed from the options.

@difficulty moderate

@Order 1

@option \(40\ \text{km/h}\)

@option \(50\ \text{km/h}\)

@option \(60\ \text{km/h}\)

@option \(80\ \text{km/h}\)

@@option \(40\ \text{km/h}\)

@explanation Let speed = \(v\ \text{km/h}\).

Time taken normally = \(\frac{120}{v}\) hours.

Time taken with \(10\ \text{km/h}\) faster = \(\frac{120}{v+10}\) hours.

The difference is \(36\ \text{minutes} = \frac{36}{60}\ \text{hours}\).

Solving \(\frac{120}{v} - \frac{120}{v+10} = \frac{3}{5}\) gives \(v = 40\ \text{km/h}\).

@subject Quantitative Math

@unit Problem Solving

@topic Word Problems

@plusmarks 1

@title Circumradius of a Triangle from Coordinates

@description Calculate the radius of the circumcircle of a triangle whose vertices are given in coordinate form.

@question The vertices of a triangle are A(1, 2), B(4, 6), and C(7, 2). Find the radius of the circle passing through these three points.

(https://raw.githubusercontent.com/Code-Explorer97/Math-Question-Generation-LLM/main/KaifSiddiqui-Traiangle.png)

@instruction Choose the correct value of the circumradius.

@difficulty hard

@Order 2

@option \(\sqrt{13}\)

@option \(\dfrac{5\sqrt{13}}{2}\)

@option 5

@option \(\dfrac{13}{2}\)

@@option \(\dfrac{25}{8}\)

@explanation

Using distance formula: \(AB=5,\ BC=5,\ CA=6\). Area \(\Delta=12\). Using circumradius formula \(R=\dfrac{abc}{4\Delta}\) we get \(R=\dfrac{5\times5\times6}{4\times12}=\dfrac{25}{8}\).

@subject Quantitative Math

@unit Geometry and Measurement

@topic Coordinate Geometry

@plusmarks 1