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This is a problem involving uniform circular motion.

A high speed train goes around a curve with a radius of 1.5 km. What is the maximum speed of the train so that the maximum acceleration experienced by the passengers is 0.05 g?

Solution:

Since $g = 9.8 \text{ m/s}^2$ (acceleration due to gravity)

then, $a = 0.05g = 0.49 \text{ m/s}^2$ (maximum passenger acceleration)

Now, $r = 1.5 \text{ km} \times \frac{1000 \text{ m}}{1 \text{ km}} = 1500 \text{ m}$ (curve radius)

Use the centripetal acceleration equation:

$$a = \frac{v^2}{r} \quad (\text{magnitude of centripetal acceleration})$$

Substitute:

$$0.49 = \frac{v^2}{1500}, \quad v = 27.1 \text{ m/s} \quad (\text{answer})$$

(maximum train speed)