Math League Contest Problem Set 12114

Target Round Problem 2

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Randolf is going to the convenience store that is 320 meters away. He starts running at a rate of 40 kilometers per hour for the first 180 meters. After feeling tired, he decides to walk the rest of the way to the convenience store at a rate of 4 kilometers per hour. To the nearest whole number, how many seconds in total does it take him to reach the convenience store?

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

We consider 2 cases:

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

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- 180 m, 40 kph

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

We consider 2 cases:

- 180 m, 40 kph
- 140 m, 4 kph

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

$$180 \text{ m} \cdot \frac{1 \text{ hr}}{40 \text{ km}}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

$$180 \text{ m} \cdot \frac{1 \text{ hr}}{40 \text{ km}} = 180 \text{ m} \cdot \frac{3600 \text{ s}}{\qquad}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

$$180 \text{ m} \cdot \frac{1 \text{ hr}}{40 \text{ km}} = 180 \text{ m} \cdot \frac{3600 \text{ s}}{40000 \text{ m}}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

$$180\text{ m} \cdot \frac{1\text{ hr}}{40\text{ km}} = 180\text{ m} \cdot \frac{3600\text{ s}}{40000\text{ m}} = 180\text{ m} \cdot \frac{9\text{ s}}{100\text{ m}}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

$$180\text{ m} \cdot \frac{1\text{ hr}}{40\text{ km}} = 180\text{ m} \cdot \frac{3600\text{ s}}{40000\text{ m}} = 180\text{ m} \cdot \frac{9\text{ s}}{100\text{ m}}$$

$$= 9\text{ m} \cdot \frac{9\text{ s}}{5\text{ m}}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

$$180\text{ m} \cdot \frac{1\text{ hr}}{40\text{ km}} = 180\text{ m} \cdot \frac{3600\text{ s}}{40000\text{ m}} = 180\text{ m} \cdot \frac{9\text{ s}}{100\text{ m}}$$

$$= 9\text{ m} \cdot \frac{9\text{ s}}{5\text{ m}} = \frac{81\text{ s}}{5}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph:

$$180\text{ m} \cdot \frac{1\text{ hr}}{40\text{ km}} = 180\text{ m} \cdot \frac{3600\text{ s}}{40000\text{ m}} = 180\text{ m} \cdot \frac{9\text{ s}}{100\text{ m}}$$

$$= 9\text{ m} \cdot \frac{9\text{ s}}{5\text{ m}} = \frac{81\text{ s}}{5} = 16.2\text{ s}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph:

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph:

$$140 \text{ m} \cdot \frac{1 \text{ hr}}{4 \text{ km}}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph:

$$140 \text{ m} \cdot \frac{1 \text{ hr}}{4 \text{ km}} = 140 \text{ m} \cdot \frac{3600 \text{ s}}{}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph:

$$140 \text{ m} \cdot \frac{1 \text{ hr}}{4 \text{ km}} = 140 \text{ m} \cdot \frac{3600 \text{ s}}{4000 \text{ m}}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph:

$$140 \text{ m} \cdot \frac{1 \text{ hr}}{4 \text{ km}} = 140 \text{ m} \cdot \frac{3600 \text{ s}}{4000 \text{ m}} = 140 \text{ m} \cdot \frac{9 \text{ s}}{10 \text{ m}}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph:

$$140 \text{ m} \cdot \frac{1 \text{ hr}}{4 \text{ km}} = 140 \text{ m} \cdot \frac{3600 \text{ s}}{4000 \text{ m}} = 140 \text{ m} \cdot \frac{9 \text{ s}}{10 \text{ m}}$$

$$= 14 \cdot 9 \text{ s}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph:

$$140 \text{ m} \cdot \frac{1 \text{ hr}}{4 \text{ km}} = 140 \text{ m} \cdot \frac{3600 \text{ s}}{4000 \text{ m}} = 140 \text{ m} \cdot \frac{9 \text{ s}}{10 \text{ m}}$$

$$= 14 \cdot 9 \text{ s} = 126 \text{ s}$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph: 126

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph: 126

$$16.2 + 126$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph: 126

$$16.2 + 126 = 142.2$$

Compute the number of seconds Randolf takes to reach the convenience store, rounded to the nearest whole number.

180 m, 40 kph: 16.2

140 m, 4 kph: 126

$$16.2 + 126 = 142.2 \approx \boxed{142}$$

Key Concepts

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- Casework

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- Casework
- Rates