

A CAR TRAVEL FROM A TO TOWN B 145KM DISTANCE IN 3HRS 45MIN. FIND IT'S AVERAGE SPEED (A) IN KM/HR (B)

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INTRODUCTION

TRAVELING BY CAR OVER LONG DISTANCES IS A COMMON ACTIVITY, AND UNDERSTANDING HOW TO CALCULATE AVERAGE SPEED IS FUNDAMENTAL IN DETERMINING TRAVEL EFFICIENCY, TIME MANAGEMENT, AND PLANNING. WHEN A CAR COVERS A SPECIFIC DISTANCE WITHIN A CERTAIN TIME FRAME, THE AVERAGE SPEED PROVIDES INSIGHT INTO THE OVERALL PACE MAINTAINED DURING THE JOURNEY. IN THIS ARTICLE, WE EXAMINE A SCENARIO WHERE A CAR TRAVELS FROM POINT A TO TOWN B, COVERING A DISTANCE OF 145 KILOMETERS IN 3 HOURS AND 45 MINUTES, AND WE AIM TO FIND ITS AVERAGE SPEED IN KILOMETERS PER HOUR (KM/HR).

UNDERSTANDING THE PROBLEM

SCENARIO DETAILS

- DISTANCE TRAVELED: 145 KILOMETERS
- TIME TAKEN: 3 HOURS AND 45 MINUTES

THE KEY TASK IS TO COMPUTE THE AVERAGE SPEED OF THE VEHICLE DURING THIS TRIP, WHICH INVOLVES CONVERTING THE TIME INTO HOURS AND THEN APPLYING THE BASIC SPEED FORMULA.

WHY IS AVERAGE SPEED IMPORTANT?

AVERAGE SPEED IS A MEASURE OF THE OVERALL PACE OF TRAVEL, CALCULATED AS THE TOTAL DISTANCE TRAVELED DIVIDED BY THE TOTAL TIME TAKEN. IT HELPS IN:

- ESTIMATING TRAVEL TIMES FOR FUTURE TRIPS
- COMPARING DIFFERENT MODES OF TRANSPORTATION
- ANALYZING DRIVING BEHAVIOR AND EFFICIENCY
- PLANNING SCHEDULES AND AVOIDING DELAYS

CONVERTING TIME INTO HOURS

BEFORE APPLYING THE AVERAGE SPEED FORMULA, IT IS ESSENTIAL TO CONVERT THE TRAVEL TIME INTO A CONSISTENT UNIT, PREFERABLY HOURS, SINCE THE DISTANCE IS IN KILOMETERS AND SPEED IN KM/HR.

STEP-BY-STEP CONVERSION

- THE TOTAL TIME TAKEN IS 3 HOURS AND 45 MINUTES.
- SINCE 1 HOUR = 60 MINUTES, 45 MINUTES IS EQUIVALENT TO $45/60$ HOURS.

CALCULATION:

$$45 \text{ MINUTES} = \frac{45}{60} = 0.75 \text{ HOURS}$$

- THEREFORE, TOTAL TIME IN HOURS:

$$3 \text{ HOURS} + 0.75 \text{ HOURS} = 3.75 \text{ HOURS}$$

APPLYING THE AVERAGE SPEED FORMULA

THE BASIC FORMULA

THE AVERAGE SPEED (S) IS GIVEN BY:

$$S = \frac{\text{TOTAL DISTANCE}}{\text{TOTAL TIME}}$$

WHERE:

- DISTANCE (D) = 145 KM
- TIME (T) = 3.75 HOURS

CALCULATION

$$S = \frac{145 \text{ KM}}{3.75 \text{ HOURS}}$$

DIVIDING:

$$S = 38.666\ldots \text{ KM/HR}$$

ROUNDING TO TWO DECIMAL PLACES:

$$\boxed{38.67 \text{ KM/HR}}$$

THUS, THE AVERAGE SPEED OF THE CAR DURING THE TRIP IS APPROXIMATELY 38.67 KM/HR.

DETAILED EXPLANATION OF THE CALCULATION PROCESS

STEP 1: CONFIRM THE DISTANCE

THE TOTAL DISTANCE TRAVELED IS GIVEN AS 145 KM, WHICH IS STRAIGHTFORWARD.

STEP 2: CONVERT TIME TO HOURS

AS SHOWN ABOVE, 3 HOURS AND 45 MINUTES CONVERT TO 3.75 HOURS.

STEP 3: APPLY THE FORMULA

DIVIDE THE TOTAL DISTANCE BY TOTAL TIME:

$$\left[\frac{145}{3.75} \right] \approx 38.67$$

THIS VALUE INDICATES THE CONSTANT SPEED THE CAR WOULD HAVE NEEDED TO MAINTAIN THROUGHOUT THE JOURNEY TO COVER 145 KM IN 3 HOURS AND 45 MINUTES.

ADDITIONAL CONSIDERATIONS

IMPACT OF VARIABLE SPEEDS

THE CALCULATED AVERAGE SPEED IS A MEAN VALUE, ASSUMING UNIFORM MOTION. IN REALITY, THE CAR MAY HAVE TRAVELED AT VARYING SPEEDS DUE TO TRAFFIC, ROAD CONDITIONS, OR STOPS. THE AVERAGE SPEED DOESN'T REFLECT INDIVIDUAL SPEED VARIATIONS BUT PROVIDES AN OVERALL MEASURE.

SPEED LIMITS AND SAFETY

- WHILE CALCULATING AVERAGE SPEED IS USEFUL, ALWAYS ADHERE TO POSTED SPEED LIMITS.
- MAINTAINING A SAFE AND LEGAL SPEED IS CRUCIAL, ESPECIALLY FOR LONG JOURNEYS.

IMPLICATIONS OF THE CALCULATED SPEED

- AN AVERAGE SPEED OF APPROXIMATELY 38.67 KM/HR SUGGESTS A MODERATE PACE, POSSIBLY INDICATING CITY DRIVING, TRAFFIC CONGESTION, OR STOPS.
- FOR COMPARISON, HIGHWAY SPEEDS TYPICALLY RANGE FROM 80 TO 120 KM/HR, WHICH MEANS THE ACTUAL JOURNEY MAY HAVE INVOLVED SLOWER SEGMENTS.

SUMMARY

IN CONCLUSION, TO DETERMINE THE AVERAGE SPEED OF A CAR TRAVELING 145 KM IN 3 HOURS AND 45 MINUTES:

- CONVERT THE TIME INTO HOURS: 3 HOURS + 45 MINUTES = 3.75 HOURS.
- USE THE FORMULA: AVERAGE SPEED = DISTANCE / TIME.
- CALCULATE: 145 KM / 3.75 HOURS $\approx$ 38.67 KM/HR.

UNDERSTANDING THIS CALCULATION HELPS TRAVELERS AND PLANNERS ESTIMATE TRAVEL TIMES, SET EXPECTATIONS, AND IMPROVE ROUTE PLANNING.

PRACTICAL APPLICATIONS

- ESTIMATING ARRIVAL TIMES FOR FUTURE TRIPS BASED ON KNOWN DISTANCES AND SPEEDS.
- ASSESSING DRIVING HABITS AND EFFICIENCY.
- PLANNING BREAKS AND FUEL STOPS DURING LONG JOURNEYS.
- COMPARING DIFFERENT TRANSPORTATION MODES OR ROUTES.

CONCLUSION

CALCULATING THE AVERAGE SPEED IS A FUNDAMENTAL ASPECT OF UNDERSTANDING TRAVEL DYNAMICS. IN THIS SPECIFIC SCENARIO, THE CAR'S AVERAGE SPEED WAS APPROXIMATELY 38.67 KM/HR, REFLECTING A MODERATE PACE OVER THE 145 KM JOURNEY IN 3 HOURS AND 45 MINUTES. WHETHER FOR PERSONAL TRAVEL PLANNING OR ACADEMIC PURPOSES, MASTERING THIS CALCULATION ENHANCES COMPREHENSION OF MOTION AND TIME-DISTANCE RELATIONSHIPS, VITAL IN EVERYDAY LIFE AND VARIOUS PROFESSIONAL FIELDS.

NOTE: ALWAYS REMEMBER THAT THE AVERAGE SPEED DOES NOT ACCOUNT FOR INSTANTANEOUS VARIATIONS. ACTUAL DRIVING SPEEDS FLUCTUATE, SO FOR SAFETY AND LEGAL REASONS, MAINTAIN APPROPRIATE SPEEDS AND ADHERE TO TRAFFIC REGULATIONS.

FREQUENTLY ASKED QUESTIONS

WHAT IS THE AVERAGE SPEED OF A CAR TRAVELING 145 KM IN 3 HOURS 45 MINUTES?

THE AVERAGE SPEED IS APPROXIMATELY 38.67 KM/HR.

HOW DO YOU CONVERT 3 HOURS 45 MINUTES INTO HOURS FOR CALCULATING SPEED?

CONVERT 45 MINUTES INTO HOURS: $45/60 = 0.75$ HOURS. So, TOTAL TIME IN HOURS IS $3 + 0.75 = 3.75$ HOURS.

WHAT IS THE FORMULA TO CALCULATE AVERAGE SPEED IN THIS SCENARIO?

AVERAGE SPEED = TOTAL DISTANCE / TOTAL TIME. HERE, IT IS $145 \text{ km} / 3.75 \text{ hours}$.

CAN YOU CALCULATE THE AVERAGE SPEED OF THE CAR IN KM/HR?

YES, DIVIDING 145 KM BY 3.75 HOURS GIVES APPROXIMATELY 38.67 KM/HR.

WHY IS IT IMPORTANT TO CONVERT MINUTES INTO HOURS WHEN CALCULATING AVERAGE SPEED?

BECAUSE SPEED IS EXPRESSED IN KM/HR, SO TIME MUST BE IN HOURS TO MATCH THE UNITS FOR ACCURATE CALCULATION.

IF THE CAR MAINTAINED THIS AVERAGE SPEED, HOW LONG WOULD IT TAKE TO TRAVEL 200 KM?

TIME = DISTANCE / SPEED = $200 \text{ km} / 38.67 \text{ km/hr} \approx 5.17$ HOURS OR APPROXIMATELY 5 HOURS AND 10 MINUTES.

ADDITIONAL RESOURCES

A CAR TRAVEL FROM A TO TOWN B 145KM DISTANCE IN 3HRS 45MIN. FIND ITS AVERAGE SPEED (A) IN KM/HR (B)

WHEN PLANNING A ROAD TRIP OR ANALYZING TRAVEL DATA, UNDERSTANDING HOW TO CALCULATE THE AVERAGE SPEED OF A VEHICLE OVER A CERTAIN DISTANCE AND TIME IS A FUNDAMENTAL SKILL. IN THIS GUIDE, WE WILL EXPLORE THE PROBLEM OF A CAR TRAVELING FROM POINT A TO TOWN B OVER A DISTANCE OF 145 KILOMETERS IN 3 HOURS AND 45 MINUTES. OUR GOAL IS TO DETERMINE ITS AVERAGE SPEED IN KILOMETERS PER HOUR (KM/HR). THIS EXAMPLE NOT ONLY DEMONSTRATES THE PRACTICAL APPLICATION OF BASIC PHYSICS AND MATHEMATICS BUT ALSO HELPS IMPROVE PROBLEM-SOLVING SKILLS FOR TRAVEL PLANNING, TRANSPORTATION ANALYSIS, AND EXAM PREPARATION.

UNDERSTANDING THE PROBLEM

BEFORE JUMPING INTO CALCULATIONS, IT'S VITAL TO UNDERSTAND THE GIVEN DATA AND WHAT IS ASKED:

- DISTANCE (D): 145 KM
- TIME TAKEN (T): 3 HOURS 45 MINUTES
- FIND:
- (A) THE AVERAGE SPEED IN KM/HR
- (B) THE METHOD OR FORMULA USED TO FIND THE AVERAGE SPEED

THIS PROBLEM INVOLVES CONVERTING TIME INTO A CONSISTENT UNIT, APPLYING THE AVERAGE SPEED FORMULA, AND INTERPRETING THE RESULT. LET'S BREAK DOWN EACH STEP SYSTEMATICALLY.

STEP 1: CONVERTING TIME INTO HOURS

SINCE THE AVERAGE SPEED IS TO BE CALCULATED IN KM/HR, WE NEED TO CONVERT THE TOTAL TRAVEL TIME FROM HOURS AND MINUTES INTO HOURS ONLY.

WHY CONVERT TO HOURS?

SPEED IS MEASURED IN KILOMETERS PER HOUR (KM/HR), SO THE TIME UNITS MUST BE COMPATIBLE.

CONVERSION PROCESS:

- 3 HOURS 45 MINUTES CAN BE EXPRESSED AS:

$$\left[3, \text{HOURS} + 45, \text{MINUTES} \right]$$

- SINCE 1 HOUR = 60 MINUTES, CONVERT 45 MINUTES TO HOURS:

$$\left[\frac{45}{60} = 0.75, \text{HOURS} \right]$$

- THEREFORE, TOTAL TIME IN HOURS:

$$\left[T = 3 + 0.75 = 3.75, \text{HOURS} \right]$$

STEP 2: RECALL THE FORMULA FOR AVERAGE SPEED

THE FUNDAMENTAL FORMULA FOR AVERAGE SPEED IS:

$$\boxed{\text{AVERAGE SPEED} (v_{\text{AVG}}) = \frac{\text{TOTAL DISTANCE} (D)}{\text{TOTAL TIME} (T)}}$$

IN WORDS:

- DIVIDE THE TOTAL DISTANCE TRAVELED BY THE TOTAL TIME TAKEN TO GET THE AVERAGE SPEED.

STEP 3: CALCULATE THE AVERAGE SPEED

PLUGGING IN THE KNOWN VALUES:

$$v_{\text{AVG}} = \frac{145, \text{KM}}{3.75, \text{HOURS}}$$

PERFORM THE DIVISION:

$$v_{\text{AVG}} = \frac{145}{3.75}$$

CALCULATING:

- $3.75 \times 38 = 142.5$
- $3.75 \times 39 = 146.25$

SINCE 145 IS BETWEEN 142.5 AND 146.25, THE AVERAGE SPEED IS AROUND 38.7 KM/HR. LET'S DO THE EXACT CALCULATION:

$$v_{\text{AVG}} = \frac{145}{3.75} = \frac{145 \times 4}{3.75 \times 4} = \frac{580}{15}$$

BECAUSE MULTIPLYING NUMERATOR AND DENOMINATOR BY 4 SIMPLIFIES THE DIVISION:

$$v_{\text{AVG}} = \frac{580}{15}$$

DIVIDE NUMERATOR BY DENOMINATOR:

$$580 \div 15 \approx 38.6667, \text{ KM/HR}$$

FINAL RESULT:

THE AVERAGE SPEED OF THE CAR IS APPROXIMATELY 38.67 KM/HR.

PART (A): THE AVERAGE SPEED IN KM/HR

ANSWER:

> THE CAR'S AVERAGE SPEED DURING THE JOURNEY FROM POINT A TO TOWN B IS APPROXIMATELY 38.67 KM/HR.

PART (B): UNDERSTANDING THE CALCULATION METHOD

TO CLARIFY THE PROCESS AND ENSURE CONFIDENCE IN THE METHOD, HERE'S A STEP-BY-STEP EXPLANATION:

STEP 1: CONVERT TIME TO HOURS

- CONVERT MINUTES INTO FRACTIONAL HOURS.

STEP 2: USE THE AVERAGE SPEED FORMULA

$$v_{\text{AVG}} = \frac{D}{T}$$

- WHERE:

- (D) = DISTANCE IN KM
- (T) = TOTAL TIME IN HOURS

STEP 3: PLUG VALUES AND PERFORM DIVISION

- SUBSTITUTE THE KNOWN VALUES INTO THE FORMULA.
- SIMPLIFY OR USE A CALCULATOR FOR DIVISION.

ADDITIONAL INSIGHTS AND RELATED CONCEPTS

UNDERSTANDING AVERAGE SPEED IS CRUCIAL IN VARIOUS CONTEXTS, FROM EVERYDAY TRAVEL TO COMPLEX TRANSPORTATION PLANNING.

1. AVERAGE SPEED VS. INSTANTANEOUS SPEED

- AVERAGE SPEED CONSIDERS THE TOTAL DISTANCE OVER TOTAL TIME, REGARDLESS OF VARIATIONS IN SPEED DURING THE JOURNEY.
- INSTANTANEOUS SPEED IS THE SPEED AT A SPECIFIC MOMENT.

2. FACTORS AFFECTING TRAVEL TIME AND SPEED

- ROAD CONDITIONS
- TRAFFIC
- SPEED LIMITS
- VEHICLE PERFORMANCE
- STOPS OR BREAKS

3. IMPLICATIONS FOR PLANNING

KNOWING THE AVERAGE SPEED HELPS IN ESTIMATING ARRIVAL TIMES, PLANNING FUEL CONSUMPTION, AND SETTING REALISTIC TRAVEL EXPECTATIONS.

PRACTICAL TIPS FOR SOLVING SIMILAR PROBLEMS

- ALWAYS CONVERT ALL UNITS TO CONSISTENT MEASUREMENTS BEFORE CALCULATIONS.
- REMEMBER THAT 1 HOUR = 60 MINUTES.
- USE THE FORMULA $(v_{\text{avg}} = \frac{D}{T})$.
- FOR TIME GIVEN IN HOURS AND MINUTES, CONVERT MINUTES TO HOURS BY DIVIDING BY 60.
- USE A CALCULATOR FOR DIVISION TO REDUCE ERRORS.

SUMMARY

IN THIS ANALYSIS, WE EXAMINED A SCENARIO WHERE A CAR TRAVELS 145 KM IN 3 HOURS AND 45 MINUTES. BY CONVERTING MINUTES INTO HOURS AND APPLYING THE AVERAGE SPEED FORMULA, WE DETERMINED THAT THE AVERAGE SPEED DURING THE JOURNEY IS APPROXIMATELY 38.67 KM/HR. THIS CALCULATION EXEMPLIFIES THE IMPORTANCE OF UNIT CONVERSION AND FUNDAMENTAL MATHEMATICAL FORMULAS IN SOLVING REAL-WORLD PROBLEMS RELATED TO TRAVEL AND TRANSPORTATION.

FINAL NOTE

UNDERSTANDING HOW TO CALCULATE AVERAGE SPEED IS ESSENTIAL FOR EFFICIENT TRAVEL PLANNING, TRANSPORTATION LOGISTICS, AND ACADEMIC ASSESSMENTS. PRACTICE WITH VARIOUS DATA SETS WILL STRENGTHEN YOUR ABILITY TO QUICKLY AND ACCURATELY DETERMINE AVERAGE SPEEDS UNDER DIFFERENT CONDITIONS.

HAPPY TRAVELING AND PROBLEM-SOLVING!

A Car Travel From A To Town B 145km Distance In 3hrs 45min Find It S Average Speed A In Km Hr B

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