

FIND THE DISTANCE TRAVELLED BY RAHUL, IF HE TAKES 6 ROUNDS OF A SQUARE FIELD OF SIDE=120M

FIND THE DISTANCE TRAVELLED BY RAHUL, IF HE TAKES 6 ROUNDS OF A SQUARE FIELD OF SIDE=120M

UNDERSTANDING HOW TO CALCULATE THE DISTANCE TRAVELED IN A GEOMETRIC CONTEXT IS FUNDAMENTAL IN MATHEMATICS, ESPECIALLY WHEN DEALING WITH PERIMETERS AND CIRCULAR OR RECTANGULAR PATHS. IN THIS ARTICLE, WE WILL EXPLORE A PRACTICAL PROBLEM INVOLVING RAHUL, WHO IS RUNNING AROUND A SQUARE FIELD. THE PROBLEM ASKS US TO FIND THE TOTAL DISTANCE HE COVERS AFTER COMPLETING SIX ROUNDS OF THE FIELD, GIVEN THE SIDE LENGTH OF THE FIELD.

THIS PROBLEM COMBINES CONCEPTS FROM GEOMETRY, SPECIFICALLY THE CALCULATION OF THE PERIMETER OF A SQUARE, AND MULTIPLICATION TO FIND THE TOTAL DISTANCE COVERED OVER MULTIPLE ROUNDS. IT'S A COMMON TYPE OF QUESTION ENCOUNTERED IN MATHEMATICS EXAMS, COMPETITIVE TESTS, AND REAL-LIFE SCENARIOS LIKE TRACKING RUNNING DISTANCES OR DESIGNING TRACKS FOR SPORTS.

BY THE END OF THIS ARTICLE, READERS WILL UNDERSTAND HOW TO APPROACH SIMILAR PROBLEMS, PERFORM THE NECESSARY CALCULATIONS ACCURATELY, AND APPRECIATE THE IMPORTANCE OF UNDERSTANDING GEOMETRIC DIMENSIONS IN PRACTICAL CONTEXTS.

UNDERSTANDING THE PROBLEM

BEFORE DIVING INTO CALCULATIONS, IT'S ESSENTIAL TO COMPREHEND THE PROBLEM STATEMENT FULLY:

- RAHUL IS RUNNING AROUND A SQUARE FIELD.
- THE SIDE LENGTH OF THE SQUARE FIELD IS 120 METERS.
- HE COMPLETES 6 ROUNDS AROUND THE FIELD.
- THE GOAL IS TO FIND THE TOTAL DISTANCE RAHUL TRAVELS AFTER THESE 6 ROUNDS.

THIS PROBLEM IS STRAIGHTFORWARD BUT REQUIRES A CLEAR UNDERSTANDING OF THE RELATIONSHIP BETWEEN THE SIDE LENGTH OF A SQUARE AND ITS PERIMETER, AS WELL AS HOW TO SCALE THAT PERIMETER BASED ON THE NUMBER OF ROUNDS.

KEY CONCEPTS AND FORMULAS

TO SOLVE THIS PROBLEM, CERTAIN GEOMETRIC FORMULAS AND CONCEPTS ARE VITAL:

PERIMETER OF A SQUARE

- THE PERIMETER OF A SQUARE IS THE TOTAL LENGTH AROUND THE SQUARE.
- IT IS CALCULATED BY ADDING THE LENGTHS OF ALL FOUR SIDES.
- SINCE ALL SIDES OF A SQUARE ARE EQUAL, THE PERIMETER (P) CAN BE CALCULATED USING THE FORMULA:

$$P = 4 \times \text{SIDE LENGTH}$$

TOTAL DISTANCE TRAVELLED

- ONCE THE PERIMETER OF THE SQUARE IS KNOWN, THE TOTAL DISTANCE RAHUL TRAVELS AFTER MULTIPLE ROUNDS IS:

$$\text{TOTAL DISTANCE} = \text{NUMBER OF ROUNDS} \times \text{PERIMETER OF THE SQUARE}$$

THIS SIMPLE MULTIPLICATION HINGES ON UNDERSTANDING THAT EACH ROUND COVERS THE SAME DISTANCE—THE PERIMETER OF

THE SQUARE.

STEP-BY-STEP CALCULATION

LET'S BREAK DOWN THE PROCESS INTO CLEAR STEPS:

STEP 1: CALCULATE THE PERIMETER OF THE SQUARE

GIVEN:

- SIDE LENGTH OF THE SQUARE = 120 METERS

USING THE FORMULA FOR PERIMETER:

- $P = 4 \times \text{SIDE LENGTH}$
- $P = 4 \times 120 = 480 \text{ METERS}$

STEP 2: DETERMINE TOTAL DISTANCE FOR 6 ROUNDS

- TOTAL DISTANCE = NUMBER OF ROUNDS $\times$ PERIMETER
- TOTAL DISTANCE = $6 \times 480 = 2880 \text{ METERS}$

THEREFORE, RAHUL TRAVELS A TOTAL DISTANCE OF 2880 METERS AFTER COMPLETING 6 ROUNDS OF THE SQUARE FIELD.

ADDITIONAL CONSIDERATIONS

WHILE THE CALCULATION APPEARS STRAIGHTFORWARD, HERE ARE SOME ADDITIONAL INSIGHTS AND CONSIDERATIONS:

UNITS OF MEASUREMENT

- THE SIDE LENGTH WAS GIVEN IN METERS, SO THE TOTAL DISTANCE IS ALSO IN METERS.
 - TO CONVERT METERS TO KILOMETERS, DIVIDE BY 1,000:
- $$2880 \text{ METERS} \div 1,000 = 2.88 \text{ KILOMETERS}$$

PRACTICAL APPLICATIONS

- ATHLETES AND COACHES OFTEN CALCULATE RUNNING DISTANCES BASED ON TRACK DIMENSIONS.
- THIS TYPE OF PROBLEM CAN HELP IN PLANNING TRAINING ROUTINES OR ESTIMATING CALORIES BURNED.
- ENGINEERS DESIGNING SPORTS TRACKS OR FIELDS NEED TO UNDERSTAND PERIMETER CALCULATIONS FOR LAYOUT PLANNING.

REAL-LIFE APPLICATIONS OF PERIMETER CALCULATIONS

UNDERSTANDING HOW TO CALCULATE THE DISTANCE TRAVELED AROUND A SQUARE OR RECTANGULAR FIELD HAS NUMEROUS PRACTICAL APPLICATIONS:

- SPORTS AND ATHLETICS: MEASURING RUNNING TRACKS, DESIGNING WORKOUT ROUTINES, OR PLANNING FIELD LAYOUTS.
- URBAN PLANNING: ESTIMATING FENCING MATERIAL NEEDED FOR ENCLOSURES OR PARKS.
- CONSTRUCTION: CALCULATING THE LENGTH OF BOUNDARY WALLS OR BORDERS.
- NAVIGATION AND PATH PLANNING: DETERMINING DISTANCES IN OUTDOOR ACTIVITIES OR ROBOTICS.

COMMON MISTAKES TO AVOID

WHEN SOLVING SUCH PROBLEMS, IT'S IMPORTANT TO WATCH OUT FOR COMMON ERRORS:

- USING THE WRONG FORMULA: REMEMBER, THE PERIMETER OF A SQUARE IS 4 TIMES THE SIDE LENGTH, NOT JUST THE SIDE LENGTH.
- MISCALCULATING THE NUMBER OF ROUNDS: ENSURE THE TOTAL NUMBER OF ROUNDS IS ACCURATELY USED IN THE MULTIPLICATION.
- UNIT CONVERSION ERRORS: BE CONSISTENT WITH UNITS TO AVOID MISCALCULATIONS, ESPECIALLY WHEN CONVERTING METERS TO KILOMETERS OR OTHER UNITS.

PRACTICE PROBLEMS

TO REINFORCE UNDERSTANDING, TRY SOLVING THESE SIMILAR PROBLEMS:

1. A RECTANGULAR FIELD HAS A LENGTH OF 150 METERS AND A WIDTH OF 100 METERS. HOW FAR WILL RAHUL TRAVEL IF HE RUNS AROUND THE FIELD 4 TIMES?
2. IF THE SIDE OF A SQUARE PLAYGROUND IS 90 METERS, HOW MUCH FENCING MATERIAL IS NEEDED TO ENCLOSE THE ENTIRE PLAYGROUND?
3. RAHUL RUNS 8 LAPS AROUND A CIRCULAR TRACK WITH A RADIUS OF 50 METERS. WHAT IS THE TOTAL DISTANCE COVERED? (USE $\pi \approx 3.14$)

ANSWERS:

1. PERIMETER OF THE RECTANGLE = $2 \times (\text{LENGTH} + \text{WIDTH}) = 2 \times (150 + 100) = 500$ METERS. TOTAL DISTANCE = $4 \times 500 = 2000$ METERS.
2. FENCING NEEDED = PERIMETER OF THE SQUARE = $4 \times 90 = 360$ METERS.
3. CIRCUMFERENCE OF THE TRACK = $2 \times \pi \times \text{RADIUS} = 2 \times 3.14 \times 50 \approx 314$ METERS. TOTAL DISTANCE = $8 \times 314 \approx 2512$ METERS.

CONCLUSION

CALCULATING THE DISTANCE RAHUL TRAVELS WHEN RUNNING AROUND A SQUARE FIELD INVOLVES UNDERSTANDING BASIC GEOMETRY PRINCIPLES, MAINLY THE PERIMETER OF A SQUARE AND SIMPLE MULTIPLICATION FOR MULTIPLE ROUNDS. IN THE SPECIFIC CASE WHERE THE SIDE LENGTH OF THE SQUARE IS 120 METERS AND RAHUL COMPLETES 6 ROUNDS, THE TOTAL DISTANCE COVERED IS 2880 METERS, OR APPROXIMATELY 2.88 KILOMETERS.

MASTERING SUCH CALCULATIONS IS NOT ONLY ESSENTIAL FOR ACADEMIC PURPOSES BUT ALSO HAS PRACTICAL SIGNIFICANCE IN SPORTS, ENGINEERING, URBAN PLANNING, AND EVERYDAY LIFE. BY DEVELOPING A CLEAR UNDERSTANDING OF HOW TO COMPUTE PERIMETERS AND SCALE THEM ACCORDING TO THE NUMBER OF ROUNDS OR REPETITIONS, YOU CAN CONFIDENTLY SOLVE A WIDE RANGE OF REAL-WORLD PROBLEMS INVOLVING DISTANCES AND BOUNDARIES.

WHETHER YOU'RE A STUDENT PREPARING FOR EXAMS OR A PROFESSIONAL WORKING IN FIELDS REQUIRING MEASUREMENTS, THESE FUNDAMENTAL CONCEPTS FORM THE FOUNDATION FOR ACCURATE AND EFFICIENT CALCULATIONS. KEEP PRACTICING WITH DIFFERENT SHAPES AND SCENARIOS TO STRENGTHEN YOUR GEOMETRIC PROBLEM-SOLVING SKILLS.

REMEMBER: ALWAYS VERIFY YOUR FORMULAS, KEEP UNITS CONSISTENT, AND DOUBLE-CHECK YOUR CALCULATIONS TO ENSURE ACCURACY.

FREQUENTLY ASKED QUESTIONS

WHAT IS THE TOTAL DISTANCE TRAVELED BY RAHUL AFTER COMPLETING 6 ROUNDS OF A SQUARE FIELD WITH SIDE LENGTH 120 METERS?

THE TOTAL DISTANCE TRAVELED IS 2880 METERS. EACH ROUND COVERS 4 TIMES THE SIDE LENGTH ($4 \times 120\text{m} = 480\text{m}$). SO, FOR 6 ROUNDS: $6 \times 480\text{m} = 2880$ METERS.

HOW DO YOU CALCULATE THE DISTANCE TRAVELED WHEN SOMEONE RUNS MULTIPLE LAPS AROUND A SQUARE FIELD?

MULTIPLY THE PERIMETER OF THE SQUARE ($4 \times \text{SIDE LENGTH}$) BY THE NUMBER OF LAPS. FOR EXAMPLE, IF THE SIDE LENGTH IS 120 METERS AND LAPS ARE 6, TOTAL DISTANCE = $6 \times (4 \times 120\text{m}) = 2880$ METERS.

WHAT IS THE PERIMETER OF A SQUARE FIELD WITH SIDE LENGTH 120 METERS?

THE PERIMETER IS 4 TIMES THE SIDE LENGTH, SO $4 \times 120\text{m} = 480$ METERS.

IF RAHUL RUNS 6 ROUNDS AROUND A SQUARE FIELD OF SIDE 120 METERS, HOW FAR DOES HE RUN IN KILOMETERS?

HE RUNS 2.88 KILOMETERS BECAUSE $2880 \text{ METERS} = 2.88 \text{ KM}$.

WHAT IS THE FORMULA TO FIND THE TOTAL DISTANCE TRAVELED IN MULTIPLE LAPS AROUND A SQUARE FIELD?

TOTAL DISTANCE = NUMBER OF LAPS $\times$ PERIMETER OF THE SQUARE. PERIMETER = $4 \times \text{SIDE LENGTH}$.

HOW WOULD THE TOTAL DISTANCE CHANGE IF THE SIDE OF THE SQUARE FIELD INCREASED TO 150 METERS BUT RAHUL STILL COMPLETES 6 ROUNDS?

THE TOTAL DISTANCE WOULD BE $6 \times (4 \times 150\text{m}) = 3600$ METERS.

IS THE DISTANCE TRAVELED BY RAHUL PROPORTIONAL TO THE NUMBER OF ROUNDS HE COMPLETES?

YES, BECAUSE THE TOTAL DISTANCE IS DIRECTLY PROPORTIONAL TO THE NUMBER OF ROUNDS, AS IT'S CALCULATED BY MULTIPLYING THE PERIMETER BY THE NUMBER OF LAPS.

WHAT IS THE IMPORTANCE OF KNOWING THE SIDE LENGTH OF THE FIELD WHEN CALCULATING DISTANCE TRAVELED?

KNOWING THE SIDE LENGTH ALLOWS YOU TO CALCULATE THE PERIMETER, WHICH IS ESSENTIAL FOR DETERMINING THE TOTAL DISTANCE TRAVELED OVER MULTIPLE LAPS.

IF RAHUL TAKES 6 ROUNDS AROUND A SQUARE FIELD, HOW MANY METERS DOES HE COVER PER ROUND?

HE COVERS 480 METERS PER ROUND, SINCE THE PERIMETER OF THE SQUARE IS $4 \times 120\text{m} = 480\text{m}$.

CAN THE METHOD USED HERE TO FIND DISTANCE BE APPLIED TO RECTANGULAR FIELDS? WHY OR WHY NOT?

YES, BUT INSTEAD OF USING THE PERIMETER OF A SQUARE, YOU WOULD CALCULATE THE PERIMETER OF THE RECTANGLE ($2 \times \text{LENGTH} + 2 \times \text{WIDTH}$) AND MULTIPLY BY THE NUMBER OF LAPS.

ADDITIONAL RESOURCES

FIND THE DISTANCE TRAVELLED BY RAHUL, IF HE TAKES 6 ROUNDS OF A SQUARE FIELD OF SIDE= 120M

UNDERSTANDING THE JOURNEY OF RAHUL ACROSS A SQUARE FIELD INVOLVES A BLEND OF BASIC GEOMETRY AND SIMPLE ARITHMETIC CALCULATIONS. WHETHER YOU'RE A STUDENT BRUSHING UP ON YOUR MATH SKILLS OR AN ENTHUSIAST CURIOUS ABOUT REAL-WORLD APPLICATIONS OF GEOMETRY, THIS PROBLEM PROVIDES AN EXCELLENT EXAMPLE OF HOW FUNDAMENTAL CONCEPTS CAN BE APPLIED TO EVERYDAY SITUATIONS. IN THIS ARTICLE, WE'LL EXPLORE HOW TO DETERMINE THE TOTAL DISTANCE RAHUL TRAVELS WHEN HE COMPLETES SIX LAPS AROUND A SQUARE FIELD WITH A SIDE LENGTH OF 120 METERS.

UNDERSTANDING THE PROBLEM: KEY DETAILS AND WHAT IS BEING ASKED

BEFORE DIVING INTO THE CALCULATIONS, IT'S CRUCIAL TO GRASP THE CORE ELEMENTS OF THE PROBLEM:

- SHAPE OF THE FIELD: SQUARE
- SIDE LENGTH OF THE SQUARE: 120 METERS
- NUMBER OF ROUNDS: 6

THE QUESTION POSED IS: "FIND THE TOTAL DISTANCE TRAVELED BY RAHUL IF HE COMPLETES SIX ROUNDS OF THE SQUARE FIELD." IN ESSENCE, THE PROBLEM ASKS US TO DETERMINE THE TOTAL LENGTH OF THE PATH RAHUL COVERS AFTER CIRCLING THE FIELD SIX TIMES.

THIS STRAIGHTFORWARD PROBLEM PROVIDES AN EXCELLENT OPPORTUNITY TO REVISIT CONCEPTS RELATED TO PERIMETERS OF GEOMETRIC FIGURES AND MULTIPLICATION FOR REPEATED DISTANCES.

STEP 1: CALCULATING THE PERIMETER OF THE SQUARE FIELD

THE FIRST STEP IS TO FIND THE DISTANCE RAHUL COVERS IN A SINGLE LAP AROUND THE FIELD. SINCE THE FIELD IS SQUARE, ALL FOUR SIDES ARE EQUAL IN LENGTH.

PERIMETER OF A SQUARE IS CALCULATED USING THE FORMULA:

$$P = 4 \times \text{SIDE LENGTH}$$

GIVEN:

- SIDE LENGTH ($s = 120 \text{ METERS}$)

CALCULATING:

$$P = 4 \times 120 = 480 \text{ METERS}$$

INTERPRETATION:

RAHUL COVERS 480 METERS IN ONE COMPLETE ROUND AROUND THE SQUARE FIELD.

STEP 2: CALCULATING THE TOTAL DISTANCE FOR SIX ROUNDS

NOW THAT WE KNOW THE PERIMETER OF ONE LAP, DETERMINING THE TOTAL DISTANCE RAHUL TRAVELS AFTER COMPLETING SIX ROUNDS IS STRAIGHTFORWARD—SIMPLY MULTIPLY THE PERIMETER BY SIX:

$$\text{Total Distance} = \text{Number of Rounds} \times \text{Perimeter of the Field}$$

PLUGGING IN THE VALUES:

$$\text{Total Distance} = 6 \times 480 = 2880 \text{ meters}$$

RESULT:

RAHUL TRAVELS 2880 METERS IN SIX ROUNDS OF THE SQUARE FIELD.

UNDERSTANDING THE PRACTICAL IMPLICATIONS AND REAL-LIFE APPLICATIONS

WHILE THIS PROBLEM MIGHT SEEM PURELY THEORETICAL, IT MIRRORS REAL-WORLD SCENARIOS SUCH AS:

- JOGGING OR RUNNING: ATHLETES OFTEN MEASURE THEIR TRAINING ROUTES, WHICH ARE OFTEN LOOPS AROUND FIELDS, PARKS, OR TRACKS.
- AGRICULTURAL PLANNING: FARMERS MIGHT ESTIMATE THE LENGTH OF FENCING NEEDED FOR A CERTAIN NUMBER OF LOOPS AROUND A FIELD.
- EVENT PLANNING: ORGANIZERS MIGHT NEED TO DETERMINE THE LENGTH OF PATHWAYS OR ROUTES FOR MARATHONS AND RACES.

IN EACH CASE, UNDERSTANDING HOW TO CALCULATE THE TOTAL DISTANCE TRAVELED BASED ON GEOMETRIC PARAMETERS IS VITAL. THE SIMPLICITY OF THIS PROBLEM UNDERSCORES THE IMPORTANCE OF GRASPING BASIC GEOMETRIC FORMULAS AND THEIR APPLICATIONS.

EXTENSIONS AND VARIATIONS OF THE PROBLEM

ONCE COMFORTABLE WITH THE BASIC CALCULATION, YOU MIGHT CONSIDER EXPLORING RELATED OR MORE COMPLEX SCENARIOS:

- DIFFERENT SHAPES: HOW WOULD THE CALCULATION CHANGE IF THE FIELD WERE RECTANGULAR, CIRCULAR, OR IRREGULAR?
- MULTIPLE FIELDS: WHAT IF RAHUL RUNS AROUND MULTIPLE FIELDS OF VARYING SIZES?
- SPEED AND TIME: IF RAHUL'S SPEED IS KNOWN, HOW LONG DOES HE TAKE TO COMPLETE SIX ROUNDS?
- ELEVATION OR TERRAIN: HOW DOES TERRAIN AFFECT THE ACTUAL DISTANCE TRAVELED VERSUS THE GEOMETRIC CALCULATION?

EACH VARIATION OFFERS ADDITIONAL AVENUES TO APPLY AND DEEPEN UNDERSTANDING OF GEOMETRY AND ARITHMETIC PRINCIPLES.

SUMMARY AND KEY TAKEAWAYS

TO RECAP:

- THE PERIMETER OF A SQUARE WITH SIDE LENGTH 120 METERS IS 480 METERS.
- RAHUL COMPLETES 6 ROUNDS, SO TOTAL DISTANCE TRAVELED IS:

$$6 \times 480 = 2880 \text{ METERS}$$

- CONVERTING METERS TO KILOMETERS:

$$2880 \text{ METERS} = 2.88 \text{ KILOMETERS}$$

FINAL NOTE:

WHETHER FOR PERSONAL FITNESS TRACKING, ENGINEERING, OR ACADEMIC PURPOSES, MASTERING HOW TO COMPUTE DISTANCES BASED ON GEOMETRIC FIGURES IS ESSENTIAL. THIS PROBLEM EXEMPLIFIES HOW SIMPLE FORMULAS CAN BE APPLIED TO DETERMINE REAL-WORLD MEASUREMENTS EFFICIENTLY.

CONCLUSION

CALCULATING THE TOTAL DISTANCE RAHUL TRAVELS BY TAKING SIX ROUNDS AROUND A SQUARE FIELD OF SIDE 120 METERS IS A STRAIGHTFORWARD YET FUNDAMENTAL EXERCISE IN GEOMETRY. IT DEMONSTRATES THE IMPORTANCE OF UNDERSTANDING PERIMETERS AND THEIR PRACTICAL APPLICATIONS. WITH A TOTAL DISTANCE OF 2880 METERS (OR 2.88 KILOMETERS), RAHUL'S JOURNEY EXEMPLIFIES HOW BASIC MATHEMATICAL PRINCIPLES UNDERPIN MANY EVERYDAY ACTIVITIES, FROM SPORTS TO CONSTRUCTION. BY MASTERING THESE CONCEPTS, INDIVIDUALS CAN BETTER INTERPRET AND ANALYZE PHYSICAL SPACES, ENHANCING BOTH THEIR MATHEMATICAL LITERACY AND REAL-WORLD PROBLEM-SOLVING SKILLS.

[Find The Distance Travelled By Rahul If He Takes 6 Rounds Of A Square Field Of Side 120m](#)

Find The Distance Travelled By Rahul If He Takes 6 Rounds Of A Square Field Of Side 120m

Related Articles

- [Pay Attention To Time. What Is The Day And Year During The First Scene At Daisy's House?](#)
- [Different Ways: How Do Paragraphs 4-5 Contribute To The Development Of Ideas In The Text?](#)
- [Where Are The Most Densely Populated Areas Of Japan With Over 1000 People Per Kilometer?](#)

[Back to Home](#)