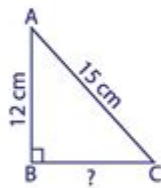# Pythagorean Theorem Worksheet Answers Sheet 1

Name : _____

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Pythagorean Theorem

Sheet 1

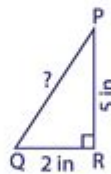Determine the missing length in each right triangle using the Pythagorean theorem. Round the answer to the nearest tenth.
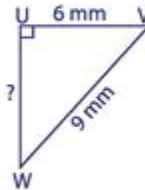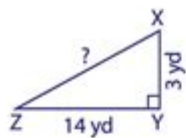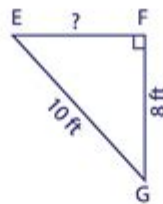
1)

A

12 cm

15 cm

B   ?   C

BC = _____

2)

P

?

5 in

Q 2 in R

PQ = _____

3)

U   6 mm   V

?

9 mm

W

UW = _____

4)

X

?

3 yd

Z   14 yd   Y

XZ = _____

5)

E   ?   F

10 ft

8 ft

G

EF = _____

6)

J

13 m

?

K   17 m   L

JL = _____

7)

L   16 in   N

8 in

?

M

MN = _____

8)

S

?

4 cm

T 1 cm U

ST = _____

9)

E

?

11 yd

C   7 yd   D
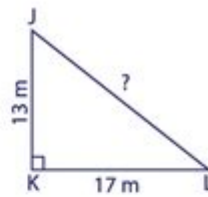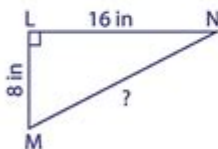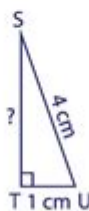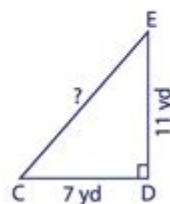
CE = _____

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Pythagorean theorem worksheet answers sheet 1 is an essential resource for students learning about this fundamental concept in geometry. The Pythagorean theorem, which states that in a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other two sides, is a cornerstone of mathematical education. This article aims to provide a comprehensive overview of the Pythagorean theorem, how to solve related problems, and detailed answers to common worksheet questions, particularly focusing on answers sheet 1.

Understanding the Pythagorean Theorem

The Pythagorean theorem can be expressed with the formula:

$$ c^2 = a^2 + b^2 $$

where:
- c is the length of the hypotenuse,
- a and b are the lengths of the two other sides of the right triangle.

This theorem is not only pivotal in geometry but also has applications in various fields, including physics, engineering, and architecture.

Applications of the Pythagorean Theorem

The theorem has numerous practical applications, such as:

1. Construction: Ensuring structures are built at right angles.
2. Navigation: Determining the shortest path between two points.
3. Computer Graphics: Calculating distances in rendering images.
4. Surveying: Measuring land and plotting maps.

Common Problems in Pythagorean Theorem Worksheets

Worksheets on the Pythagorean theorem typically present a variety of problems, including:

- Finding the length of the hypotenuse when the lengths of the other two sides are given.
- Finding one of the other sides when the hypotenuse and one side are provided.
- Word problems that involve real-life applications of the theorem.

Types of Questions

1. Direct Calculation: Calculate the hypotenuse.
2. Finding a Side: Determine a missing side length.
3. Word Problems: Solve contextual problems using the theorem.

Example Problems and Solutions

To illustrate how to apply the Pythagorean theorem, the following examples will be solved

step-by-step.

Example 1: Finding the Hypotenuse

Problem: A right triangle has one side measuring 3 cm and another side measuring 4 cm. Find the length of the hypotenuse.

Solution:
- Given: $a = 3$ cm, $b = 4$ cm
- Using the Pythagorean theorem:

$$ c^2 = a^2 + b^2 $$
$$ c^2 = 3^2 + 4^2 $$
$$ c^2 = 9 + 16 $$
$$ c^2 = 25 $$
$$ c = \sqrt{25} $$
$$ c = 5 \text{ cm} $$

Answer: The hypotenuse is 5 cm.

Example 2: Finding a Side

Problem: The hypotenuse of a right triangle is 10 cm, and one side is 6 cm. Find the other side.

Solution:
- Given: $c = 10$ cm, $a = 6$ cm
- We need to find b:

$$ c^2 = a^2 + b^2 $$
$$ 10^2 = 6^2 + b^2 $$
$$ 100 = 36 + b^2 $$
$$ b^2 = 100 - 36 $$
$$ b^2 = 64 $$
$$ b = \sqrt{64} $$
$$ b = 8 \text{ cm} $$

Answer: The other side is 8 cm.

Example 3: Word Problem

Problem: A ladder is leaning against a wall. The foot of the ladder is 7 feet away from the wall, and the top of the ladder reaches a height of 24 feet on the wall. How long is the ladder?

Solution:
- Given: Distance from the wall \(a = 7 \) feet, height on the wall \(b = 24 \) feet.
- We need to find the length of the ladder \(c \):

\[c^2 = a^2 + b^2 \]
\[c^2 = 7^2 + 24^2 \]
\[c^2 = 49 + 576 \]
\[c^2 = 625 \]
\[c = \sqrt{625} \]
\[c = 25 \text{ feet} \]

Answer: The ladder is 25 feet long.

Pythagorean Theorem Worksheet Answers Sheet 1

The worksheet typically contains a variety of problems. Below are the answers to the problems found on answers sheet 1.

Sample Questions and Answers

1. Problem: Find the hypotenuse if one side is 5 cm and the other side is 12 cm.
- Answer: 13 cm

2. Problem: If the hypotenuse is 15 cm and one side is 9 cm, find the other side.
- Answer: 12 cm

3. Problem: A right triangle has sides measuring 8 cm and 15 cm. What is the length of the hypotenuse?
- Answer: 17 cm

4. Problem: The lengths of two sides of a right triangle are 20 cm and 21 cm. What is the length of the hypotenuse?
- Answer: 29 cm

5. Problem: A rectangular park has a width of 6 meters and a length of 8 meters. If a diagonal path is constructed, what will be the length of the path?
- Answer: 10 meters

Conclusion

The Pythagorean theorem is a vital concept in mathematics that helps students develop problem-solving skills and understand the relationship between the sides of right triangles. The answers provided in the Pythagorean theorem worksheet answers sheet 1

serve as a guide for students to check their understanding and accuracy. Mastery of this theorem not only prepares students for more advanced mathematical concepts but also equips them with practical skills applicable in everyday life. By practicing various problems, students can build confidence and proficiency in using the Pythagorean theorem effectively.

Frequently Asked Questions

What is the Pythagorean theorem?

The Pythagorean theorem states that in a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the other two sides.

How do you use a worksheet for the Pythagorean theorem?

A worksheet typically provides problems where you can practice applying the Pythagorean theorem to find missing side lengths of right triangles.

What is the formula represented in the Pythagorean theorem worksheet?

The formula is $a^2 + b^2 = c^2$, where 'c' is the length of the hypotenuse and 'a' and 'b' are the lengths of the other two sides.

What kind of problems can be found on a Pythagorean theorem worksheet?

Problems may include calculating the length of a side of a right triangle when the lengths of the other two sides are known, and word problems involving real-life applications.

How can you check your answers on a Pythagorean theorem worksheet?

You can check your answers by substituting your calculated side lengths back into the equation $a^2 + b^2 = c^2$ to see if the equation holds true.

Are there online resources available for Pythagorean theorem worksheets?

Yes, there are numerous educational websites that offer free printable Pythagorean theorem worksheets and answer sheets.

What skills do students develop by completing a

Pythagorean theorem worksheet?

Students develop critical thinking skills, problem-solving abilities, and a better understanding of the relationship between the sides of right triangles.

Can the Pythagorean theorem be applied in real-life situations?

Yes, the Pythagorean theorem can be applied in various fields such as architecture, construction, navigation, and physics to determine distances and heights.

What should you do if you get stuck on a problem in the Pythagorean theorem worksheet?

If you're stuck, try reviewing the theorem, double-check your calculations, or consult your teacher or a classmate for help.

How do you find the hypotenuse using the Pythagorean theorem?

To find the hypotenuse, rearrange the formula to $c = \sqrt{a^2 + b^2}$ and plug in the values of sides 'a' and 'b' to calculate 'c'.

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