

Pythagoras Theorem Worksheet

Name: _____ Date: _____ Class: _____ Marks / 34

A. Find the Hypotenuse

Use Pythagoras' theorem to find the missing side. Show your working.

1. A right triangle has legs of **3 cm** and **4 cm**. $c = \underline{\hspace{2cm}} \text{ cm}$
2. A right triangle has legs of **5 m** and **12 m**. $c = \underline{\hspace{2cm}} \text{ m}$
3. A right triangle has legs of **8 cm** and **15 cm**. $c = \underline{\hspace{2cm}} \text{ cm}$
4. A right triangle has legs of **7 m** and **24 m**. $c = \underline{\hspace{2cm}} \text{ m}$
5. A right triangle has legs of **9 cm** and **12 cm**. $c = \underline{\hspace{2cm}} \text{ cm}$

B. Find the Missing Leg

Find the unknown side. Round your answer to **1 decimal place** where necessary.

6. The hypotenuse is **13 cm** and one leg is **5 cm**. **Missing side** = $\underline{\hspace{2cm}} \text{ cm}$
7. The hypotenuse is **10 m** and one leg is **6 m**. **Missing side** = $\underline{\hspace{2cm}} \text{ m}$
8. The hypotenuse is **17 cm** and one leg is **8 cm**. **Missing side** = $\underline{\hspace{2cm}} \text{ cm}$
9. The hypotenuse is **25 m** and one leg is **7 m**. **Missing side** = $\underline{\hspace{2cm}} \text{ m}$
10. The hypotenuse is **20 cm** and one leg is **16 cm**. **Missing side** = $\underline{\hspace{2cm}} \text{ cm}$

C. Multiple Choice

Circle the correct answer.

11. Which equation represents Pythagoras' theorem?

- A. $a+b=c$ B. $a^2+b^2=c^2$ C. $a^2-b^2=c^2$ D. $2a+2b=c$

12. Which side is always the **hypotenuse**?

- A. The shortest side B. The side next to the smallest angle
C. The side opposite the right angle D. Any horizontal side

13. A triangle has sides 6 cm, 8 cm and 10 cm. What type of triangle is it?

- A. Equilateral B. Isosceles C. Right-angled D. Obtuse

14. If $a=9$ and $b=12$, what is c ? A. 13 B. 15 C. 18 D. 21

D. True or False

Write True or False.

15. Pythagoras' theorem can be used with every triangle.

16. The hypotenuse is always the longest side of a right-angled triangle.

17. If the legs are 6 cm and 8 cm, the hypotenuse is 10 cm.

18. The formula can be rearranged to find a missing leg.

19. A triangle with sides 5, 12 and 13 is a right-angled triangle.

E. Find the Error

A student solves this problem:

A right triangle has legs of 6 cm and 8 cm.

$$C^2 = 6^2 + 8^2$$

$$c^2 = 36 + 64$$

$$C = 100$$

20. What mistake did the student make?

21. Find the correct answer. $c =$ _____ cm

F. Word Problems

22. Ladder Problem

A ladder is **10 m** long and rests against a wall. The bottom of the ladder is **6 m** from the wall.

How high up the wall does the ladder reach?

Answer: _____ m

23. Diagonal of a Rectangle

A rectangular garden is **12 m** long and **5 m** wide. Find the length of the diagonal. **Answer:** _____ m

24. Shortest Route

A person walks **9 km east** and then **12 km north**. How far are they from their starting point in a straight line?

Answer: _____ km

25. Ramp Problem

A wheelchair ramp is **13 m** long and rises **5 m** vertically.

How far does the bottom of the ramp extend horizontally?

Answer: _____ m

G. Does It Form a Right Triangle?

Use Pythagoras' theorem to determine whether each set of sides forms a right-angled triangle.

26. **7 cm, 24 cm, 25 cm**

Right-angled? **Yes / No**

Working:

27. **6 cm, 10 cm, 12 cm**

Right-angled? **Yes / No**

Working:

28. **9 cm, 12 cm, 15 cm**

Right-angled? **Yes / No**

Working:

29. **8 cm, 10 cm, 12 cm**

Right-angled? **Yes / No**

Working:

H.

30. A right-angled triangle has a hypotenuse of **29 cm** and one leg of **20 cm**.

Find the other leg. **Answer:** _____ **cm**

31. The diagonal of a square is **10 cm**.

Find the length of each side of the square. Give your answer to **1 decimal place**. **Answer:** _____ **cm**

32. A rectangular field measures **18 m by 24 m**.

A person walks directly from one corner to the opposite corner.

How far do they walk? **Answer:** _____ **m**

33. A right-angled triangle has an area of **30 cm²**. One of its legs is **5 cm**.

Find the length of the other leg and then find the hypotenuse.

Other leg: _____ **cm** Hypotenuse: _____ **cm**

34. Can a triangle with sides **10 cm, 24 cm and 26 cm** be a right-angled triangle?

Explain your answer using Pythagoras' theorem.
