

Name _____

Date _____

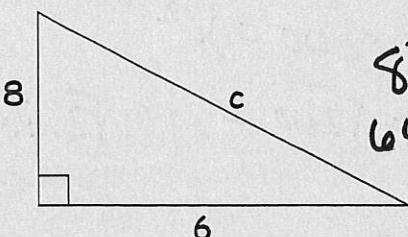
Period _____

Pythagorean Theorem Worksheet

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

Solve for each variable. Leave answer in simplest radical form. Show all work.

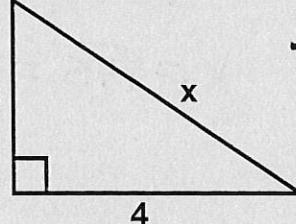
1.



$$\begin{aligned} 8^2 + 6^2 &= c^2 \\ 64 + 36 &= c^2 \\ 100 &= c^2 \end{aligned}$$

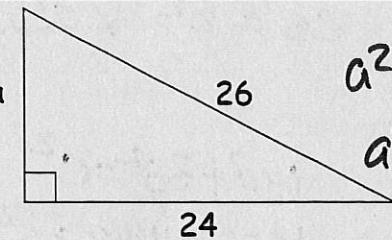
$$c = 10$$

5.



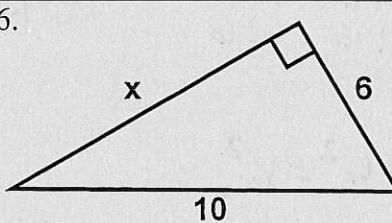
$$\begin{aligned} 3^2 + 4^2 &= x^2 \\ 9 + 16 &= x^2 \\ 25 &= x^2 \\ x &= 5 \end{aligned}$$

2.



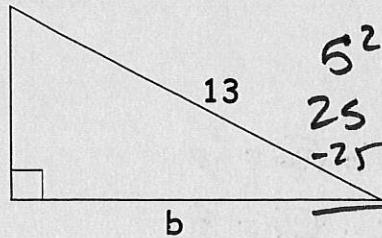
$$\begin{aligned} a^2 + 24^2 &= 26^2 \\ a^2 + 576 &= 676 \\ -576 & \quad -576 \\ a^2 &= 100 \\ a &= 10 \end{aligned}$$

6.



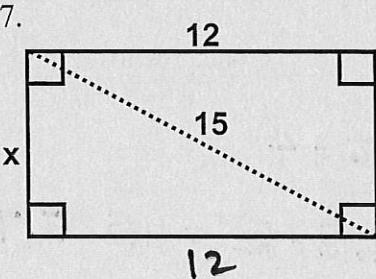
$$\begin{aligned} 6^2 + x^2 &= 10^2 \\ 36 + x^2 &= 100 \\ -36 & \quad -36 \\ x^2 &= 64 \\ x &= 8 \end{aligned}$$

3.



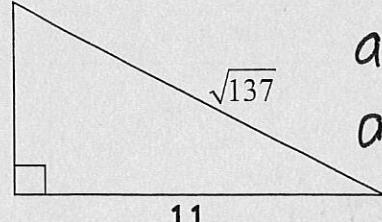
$$\begin{aligned} 5^2 + b^2 &= 13^2 \\ 25 + b^2 &= 169 \\ -25 & \quad -25 \\ b^2 &= 144 \\ b &= 12 \end{aligned}$$

7.



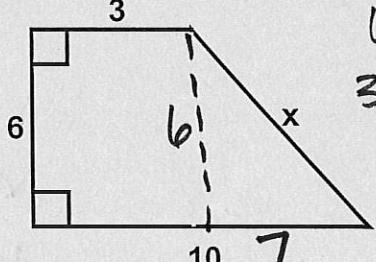
$$\begin{aligned} x^2 + 12^2 &= 15^2 \\ x^2 + 144 &= 225 \\ -144 & \quad -144 \\ x^2 &= 81 \\ x &= 9 \end{aligned}$$

4.



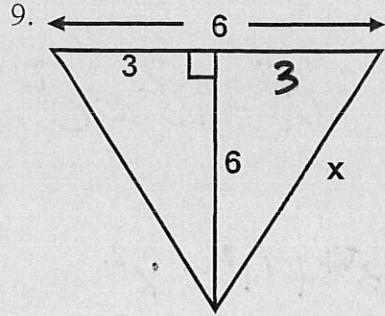
$$\begin{aligned} a^2 + 11^2 &= \sqrt{137} \\ a^2 + 121 &= 137 \\ -121 & \quad -121 \\ a^2 &= 16 \\ a &= 4 \end{aligned}$$

8.



$$\begin{aligned} 6^2 + 8^2 &= x^2 \\ 36 + 64 &= x^2 \\ 100 &= x^2 \\ x &= \sqrt{100} \end{aligned}$$

$$x = \sqrt{100}$$



$$\begin{aligned}
 3^2 + 6^2 &= x^2 \\
 9 + 36 &= x^2 \\
 45 &= x^2 \\
 x &= \sqrt{45} = 3\sqrt{5}
 \end{aligned}$$

10. The length of one of the legs in a right triangle is 4 inches. If the hypotenuse is 12 inches long, what is the length of the other leg?

$$\begin{array}{ccc}
 \text{Diagram of a right triangle with legs 4 and } a, \text{ hypotenuse } 12. & a^2 + 4^2 = 12^2 & a^2 = \sqrt{128} \\
 & a^2 + 16 = 144 & -16 \quad -16 \\
 & 8^2 & 8\sqrt{2} \text{ in}
 \end{array}$$

11. Find the length of a diagonal of a square enclosure with a perimeter of 16 feet.

$$\begin{array}{l}
 \text{Diagram of a square with side 4, diagonal } x. \\
 4^2 + 4^2 = x^2 \\
 16 + 16 = x^2 \\
 32 = x^2 \\
 x = \sqrt{32} = 4\sqrt{2} \text{ ft}
 \end{array}$$

12. Find the length of the diagonal of a square whose side length is 10 inches

$$\begin{array}{l}
 \text{Diagram of a square with side 10, diagonal } x. \\
 10^2 + 10^2 = x^2 \\
 100 + 100 = x^2 \\
 200 = x^2 \\
 x = \sqrt{200} = 10\sqrt{2} \text{ in}
 \end{array}$$

13. The diagonal crossbar of an old wooden gate has rusted. The gate is rectangular, 3 feet by 4 feet. How long is the crossbar (diagonal)?

$$\begin{array}{l}
 \text{Diagram of a rectangle with sides 3 and 4, diagonal } x. \\
 3^2 + 4^2 = x^2 \\
 9 + 16 = x^2 \\
 25 = x^2 \\
 x = 5 \text{ ft}
 \end{array}$$

14. What is the diagonal measurement of the TV screen shown in the figure below?

$$\begin{array}{l}
 \text{Diagram of a TV screen with width 38 in and height 26 in.} \\
 44^2 + 38^2 = c^2 \\
 1936 + 1444 = c^2 \\
 3380 = c^2 \\
 c = 2\sqrt{845} \text{ or } 58.1 \text{ in}
 \end{array}$$

Given the following vertices, find the lengths of each side of the right triangle.

15. A(4, -3), B(8, -3), C(4, -7)

$$AB = \sqrt{4^2 + 0^2} = \sqrt{16} = 4$$

$$BC = \sqrt{4^2 + 4^2} = \sqrt{16 + 16} = \sqrt{32} = 4\sqrt{2} \quad 5.7$$

$$AC = \sqrt{0^2 + 4^2} = \sqrt{16} = 4$$

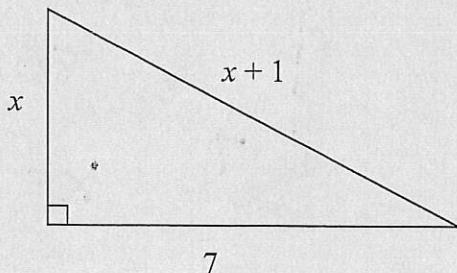
16. A(0, 0), B(6, 0), C(6, 8)

$$AB = \sqrt{6^2 + 0^2} = \sqrt{36} = 6$$

$$BC = \sqrt{0^2 + 8^2} = \sqrt{64} = 8$$

$$AC = \sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$$

17. Solve for x:



$$\begin{aligned}
 x^2 + 7^2 &= (x+1)^2 \\
 x^2 + 49 &= (x+1)(x+1) \\
 x^2 + 49 &= x^2 + x + x + 1 \\
 x^2 + 49 &= x^2 + 2x + 1 \\
 -x^2 & \quad -x^2 \\
 49 &= 2x + 1 \\
 -1 & \quad -1 \\
 48 &= 2x \\
 24 &= x
 \end{aligned}$$