

NAME:

PYTHAGOREAN THEOREM - WORKSHEET

For each triangle find the missing length. Round your answer to the nearest tenth. Then find the area and the perimeter.

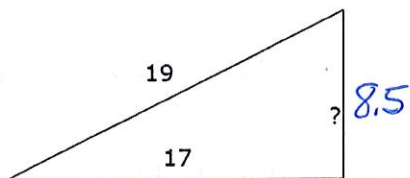
$$a^2 + b^2 = c^2$$

$$17^2 + b^2 = 19^2$$

$$289 + b^2 = 361$$

$$-289 \quad -289$$

$$\sqrt{b^2 = 72}$$



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

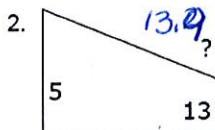
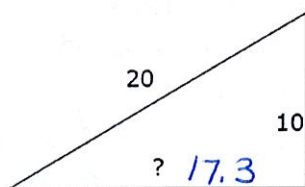
$$10^2 + b^2 = 20^2$$

$$100 + b^2 = 400$$

$$-100 \quad -100$$

$$b^2 = 300$$

$$\boxed{b = 17.3}$$



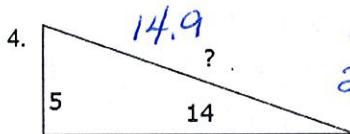
$$a^2 + b^2 = c^2$$

$$5^2 + 13^2 = c^2$$

$$25 + 169 = c^2$$

$$\sqrt{194} = \sqrt{c^2}$$

$$13.9 = c$$



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

$$5^2 + 14^2 = c^2$$

$$25 + 196 = c^2$$

$$\sqrt{221} = \sqrt{c^2}$$

$$14.9 = c$$

For #5-9 c is the hypotenuse of the right triangle ABC with sides a, b, c

5. a = 12; b = 5; c = 13

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

$$12^2 + 5^2$$

$$144 + 25 =$$

$$\sqrt{169} = c$$

6. a = 8; b = b; c = 10

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

$$8^2 + b^2 = 10^2$$

$$64 + b^2 = 100$$

$$-64 \quad -64$$

$$\sqrt{b^2} = \sqrt{36} = b$$

7. a = 15; b = 8; c = 17

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

$$15^2 + b^2 = 17^2$$

$$225 + b^2 = 289$$

$$-225 \quad -225$$

$$\sqrt{b^2} = \sqrt{64}$$

$$b = 8$$

8. a = 30; b = 40; c = 50

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

$$a^2 + 40^2 = 50^2$$

$$a^2 + 1600 = 2500$$

$$-1600 \quad -1600$$

$$\sqrt{a^2} = \sqrt{900} = 30$$

9. a = 3.46; b = 2; c = 4

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

$$a^2 + 2^2 = 4^2$$

$$a^2 + 4 = 16$$

$$-4 \quad -4$$

$$a^2 = 12$$

$$a \approx 3.46$$

10. Find a third number so that the three numbers form a right triangle:

i) 40, 9, 41

$$\begin{aligned}
 9^2 + 41^2 &= a^2 + b^2 = c^2 \\
 81 + 1681 &= c^2 \quad 9^2 + b^2 = 41^2 \\
 = \sqrt{1762} = \sqrt{c^2} \quad 81 + b^2 &= 1681 \\
 &\quad -81 \quad -81
 \end{aligned}$$

$$b^2 = 1600 \approx \boxed{40}$$

ii) 13, 85

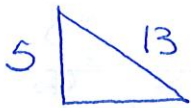
$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 13^2 &= 85^2
 \end{aligned}$$

$$\sqrt{b^2} = \sqrt{7056}$$

$$\boxed{b = 84}$$

$$\begin{aligned}
 169 + b^2 &= 7225 \\
 -169 &\quad -169
 \end{aligned}$$

11. Ms. Green tells you that a right triangle has a hypotenuse of 13 and a leg of 5. She asks you to find the other leg of the triangle. What is your answer?



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

$$5^2 + b^2 = 13^2$$

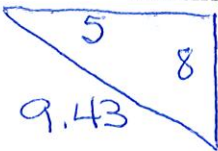
$$25 + b^2 = 169$$

$$-25 \quad -25$$

$$\sqrt{b^2} = \sqrt{144}$$

$$b = 12$$

12. Two joggers run 8 miles north and then 5 miles west. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point?



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

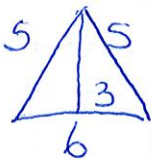
$$5^2 + 8^2 = c^2$$

$$25 + 64 = c^2$$

$$\sqrt{89} = \sqrt{c^2}$$

$$9.43 \approx c$$

13. Oscar's dog house is shaped like a tent. The slanted sides are both 5 feet long and the bottom of the house is 6 feet across. What is the height of his dog house, in feet, at its tallest point?



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

$$3^2 + 5^2 = c^2$$

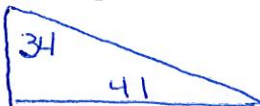
$$9 + 25 = c^2$$

$$\sqrt{34} = \sqrt{c^2}$$

$$5.83 = c$$

$$5.83 \text{ ft.}$$

14. To get from point A to point B you must avoid walking through a pond. To avoid the pond, you must walk 34 meters south and 41 meters east. To the nearest meter, how many meters would be saved if it were possible to walk through the pond?



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

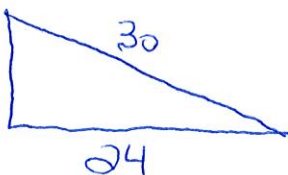
$$34^2 + 41^2 = c^2$$

$$1156 + 1681 = c^2$$

$$\sqrt{2837} = \sqrt{c^2}$$

$$\boxed{53.3 \text{ m}}$$

15. A suitcase measures 24 inches long and the diagonal is 30 inches long. How much material is needed to cover one side of the suitcase?



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

$$a^2 + 24^2 = 30^2$$

$$a^2 + 576 = 900$$

$$-576 \quad -576$$

$$\sqrt{a^2} = \sqrt{324}$$

$$a = 18$$

$$a = bh$$

$$= 24 \times 18$$

$$= 432 \text{ in.}$$

