Worksheet 7.1-7.2 Pythagorean Theorem and its Converse Prep

Name Answer Key.

Use ΔABC to determine if the equation is *true* or *false*.

1) $b^2 + a^2 = c^2$ True

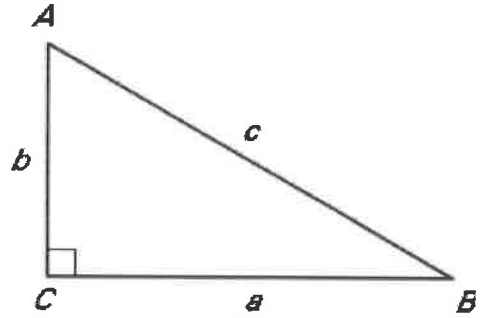
2) $c^2 - a^2 = b^2$ True

3) $b^2 - c^2 = a^2$ False

4) $c^2 = a^2 - b^2$ False

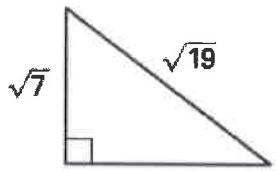
5) $c^2 = b^2 + a^2$ True

6) $a^2 = c^2 - b^2$ True



Find the unknown side lengths. Simplify answers that are radicals.

7)



$(\sqrt{7})^2 + x^2 = (\sqrt{19})^2$

$7 + x^2 = 19$

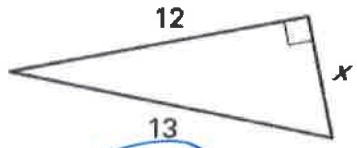
$-7 \quad -7$

$\sqrt{x^2} = \sqrt{12}$

$x = \sqrt{12}$

$x = 2\sqrt{3}$

8)



$x = 5$

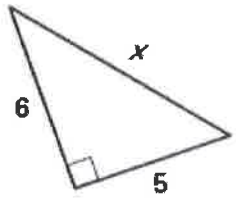
$13^2 = 12^2 + x^2$

$169 = 144 + x^2$

$\sqrt{25} = \sqrt{x^2}$

$5 = x$

9)



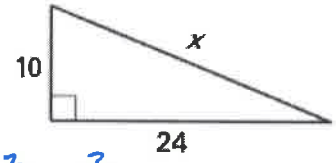
$6^2 + 5^2 = x^2$

$36 + 25 = x^2$

$\sqrt{61} = \sqrt{x^2}$

$\sqrt{61} = x$

10)



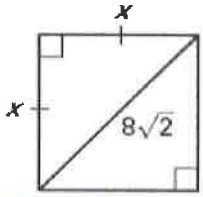
$10^2 + 24^2 = x^2$

$100 + 576 = x^2$

$\sqrt{676} = \sqrt{x^2}$

$26 = x$

11)



$x^2 + x^2 = (8\sqrt{2})^2$

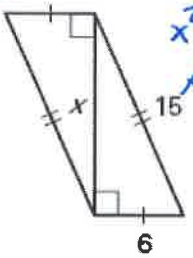
$2x^2 = 64 \cdot 2$

$2x^2 = 128$

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

$x = 8$

12)



$x^2 + 6^2 = 15^2$

$x^2 + 36 = 225$

$-36 \quad -36$

$\sqrt{x^2} = \sqrt{189}$

$x = \sqrt{189}$

$x = \sqrt{9 \cdot 21}$

$x = 3\sqrt{21}$

The given lengths are two sides of a right triangle. All three sides lengths of the triangle are integers and together form a Pythagorean triple. Find the length of the third side and tell whether it is a ***leg*** or the ***hypotenuse***.

13) 40 and 41

9 - Leg

14) 12 and 35

37

hypotenuse

15) 63 and 65

16 - Leg

16) 28 and 45

53

hypotenuse

17) 56 and 65

33

Leg

18) 20 and 29

21

Leg

Find the area of a right triangle with given leg ℓ and hypotenuse h. Round decimal answers to the nearest tenth.

22) $\ell = 8$ m, $h = 16$ m

$8^2 + w^2 = 16^2$

$w = 8\sqrt{3}$

$A = 32\sqrt{3}\ m^2$

23) $\ell = 9$ yd, $h = 12$ yd

$9^2 + w^2 = 12^2$

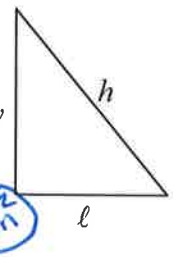
$w = \sqrt{63}$

$w = 3\sqrt{7}$

$A = \frac{3\sqrt{7} \cdot 9}{2}$

$A = \frac{27\sqrt{7}}{2}\ yd^2$

$A = \frac{\ell w}{2}$



24) $\ell = 21$ in, $h = 29$ in

$21^2 + w^2 = 29^2$

$w^2 = 400$

$w = 20$

$A = \frac{21 \cdot 20}{2}$

$A = 210\ in^2$

25) $\ell = 13$ cm, $h = 17$ cm

$13^2 + w^2 = 17^2$

$w^2 = 120$

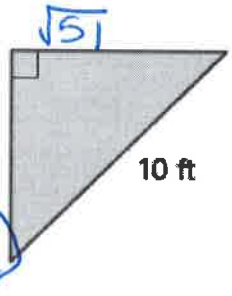
$w = 2\sqrt{30}$

$A = \frac{13 \cdot 2\sqrt{30}}{2}$

$A = 13\sqrt{30}\ cm^2$

Find the area of the figure. Round decimal answers to the nearest tenth.

26)

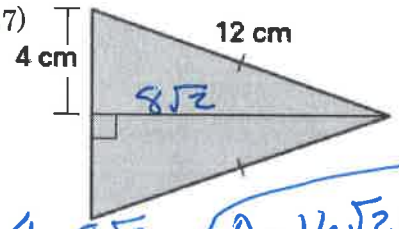


$\sqrt{51}$

$\frac{1}{2} \cdot 7 \cdot \sqrt{51}$

$A \approx 25\ ft^2$

27)



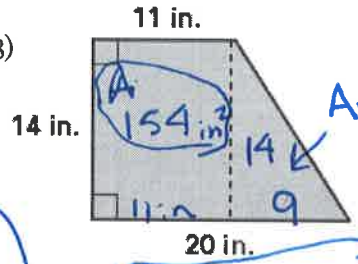
$8\sqrt{2}$

$A = \frac{1}{2} \cdot 4 \cdot 8\sqrt{2}$

$A = 16\sqrt{2}\ cm^2$

$A \approx 22.6\ cm^2$

28)



A

154 in²

14

9

Area Δ = 63

$A = 217\ in^2$

Decide whether the numbers can represent the side lengths of a triangle (2 smaller side must be greater than the 3rd). If they can, classify the triangle as *right*, *acute*, or *obtuse*.

29) 5, 12, 13

Right Δ

30) $\sqrt{8}$, 4, 6

Acute

31) 20, 21, 28

Acute

32) 15, 36, 39

Right

33) $\sqrt{13}$, 10, 12

Acute

34) 14, 48, 50

Right

35) 6, 8, 10

Right

36) 5, 7, 9

Acute

37) 8, 9, 10

Obtuse

38) 10, 12, 30

Not a triangle

39) 16, 30, 34

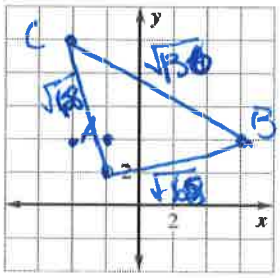
Right

40) 18, 34, 45

Acute

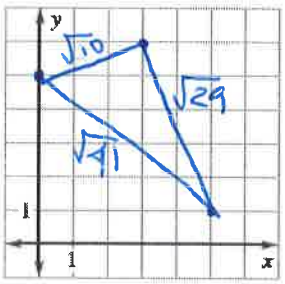
Graph points A, B, and C. Connect the points to form ΔABC. Decide whether ΔABC is *right*, *acute*, or *obtuse*.

41) $A(-2, 2)$, $B(6, 4)$, $C(-4, 10)$



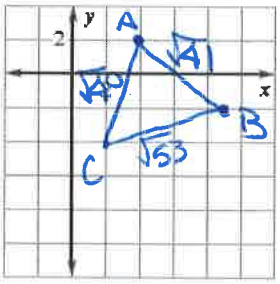
RT Δ

42) $A(0, 5)$, $B(3, 6)$, $C(5, 1)$



Not a Rt Δ
Obtuse

43) $A(4, 1)$, $B(7, -2)$, $C(2, -4)$



Not a Rt Δ
Acute