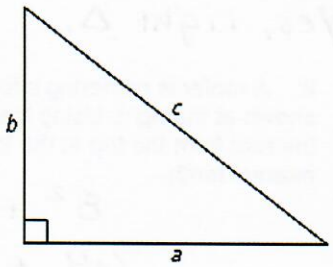
Name KEY Class _____ Date _____

10-1 Practice

Form K

The Pythagorean Theorem

Use the triangle at the right. Find the missing side length. If necessary, round to the nearest tenth.



1. $a = 16, b = 12$

$a^2 + b^2 = c^2$
$16^2 + 12^2 = c^2$
$256 + 144 = c^2$
$\sqrt{400} = \sqrt{c^2}$
$20 = c$

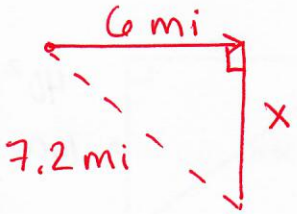
2. $a = 15, c = 20$

$15^2 + b^2 = 20^2$
$225 + b^2 = 400$
$\sqrt{b^2} = \sqrt{175}$
$b \approx 13.2$

3. $b = 32, c = 44$

$a^2 + 32^2 = 44^2$
$a^2 + 1024 = 1936$
$\sqrt{a^2} = \sqrt{912}$
$a \approx 30.2$

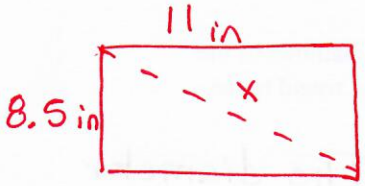
4. A hiker goes six miles east and then turns south. If the hiker finishes 7.2 miles from the starting point, how far south did the hiker go?



$6^2 + x^2 = (7.2)^2$
$36 + x^2 = 51.84$
$\sqrt{x^2} = \sqrt{15.84}$
$x \approx 3.98$ mi

The hiker walked about 4 miles south.

5. A teacher is cutting along the diagonal of a rectangular piece of construction paper for a bulletin board which is 11 inches long and 8.5 inches wide. What will be the length of the cut?



$(8.5)^2 + (11)^2 = x^2$
$72.25 + 121 = x^2$
$\sqrt{193.25} = \sqrt{x^2}$
$13.9 \text{ in} \approx x$

The length of the diagonal cut is about 13.9 in.

Determine whether the given lengths can be side lengths of a right triangle.

6. 15 m, 20 m, 25 m

$15^2 + 20^2 \stackrel{?}{=} 25^2$

$225 + 400 \stackrel{?}{=} 625$

$625 = 625$

Yes, right Δ.

7. 22 ft, 24 ft, 30 ft

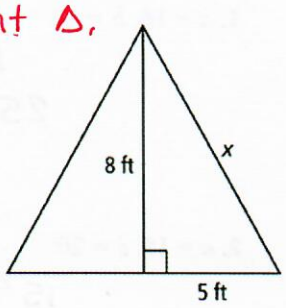
$22^2 + 24^2 \stackrel{?}{=} 30^2$

$484 + 576 \stackrel{?}{=} 900$

$1060 \neq 900$

Not a right Δ.

8. A roofer is gathering information for purchasing supplies for the roof shown at the right. Using the dimensions shown, what is the length x of the roof from the top to the lower edge? If necessary, round to the nearest tenth.



$8^2 + 5^2 = x^2$

$64 + 25 = x^2$

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

$9.4 \text{ ft} \approx x$

Any set of three positive integers that satisfies the equation $a^2 + b^2 = c^2$ is a *Pythagorean triple*. Determine whether each set of numbers is a Pythagorean triple.

9. 5, 9, 11

$5^2 + 9^2 \stackrel{?}{=} 11^2$

$25 + 81 \stackrel{?}{=} 121$

$106 \neq 121$

Not a Pythag. triple.

10. $\sqrt{3}, \sqrt{4}, \sqrt{5}$

$(\sqrt{3})^2 + (\sqrt{4})^2 \stackrel{?}{=} (\sqrt{5})^2$

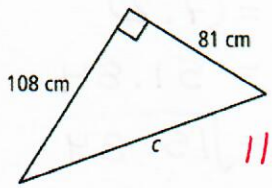
$3 + 4 = 5$

$7 = 5$

Not a Pythag triple.

Find each missing side length.

11.



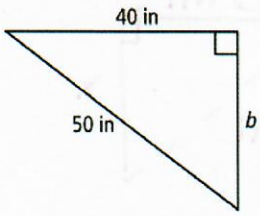
$108^2 + 81^2 = c^2$

$11664 + 6561 = c^2$

$\sqrt{18225} = \sqrt{c^2}$

$135 \text{ cm} = c$

12.



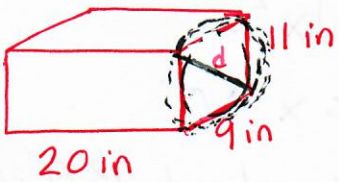
$40^2 + b^2 = 50^2$

$1600 + b^2 = 2500$

$\sqrt{b^2} = \sqrt{900}$

$b = 30 \text{ in}$

13. A rectangular box is 9 in. wide, 11 in. tall, and 20 in. long. What is the diameter of the smallest circular opening through which the box will fit? If necessary, round to the nearest tenth of a centimeter.



$11^2 + 9^2 = d^2$

$121 + 81 = d^2$

$\sqrt{202} = \sqrt{d^2}$

$14.2 \approx d$

The diameter should be at least 14.2 in.