Name _____ Date _____

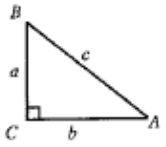
Algebra and Geometry Review, page 25, Trigonometry

The Pythagorean Theorem

■ **Concept:** Given the lengths of two sides of a right triangle, using the Pythagorean theorem to find the length of the third side

Remember: In a right triangle, the hypotenuse is the longest side, or the side opposite the right angle. The other two sides of the triangle are called legs. In any right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs: $a^2 + b^2 = c^2$.

Example: Triangle ABC shown at the right is a right triangle. Side $a = 8$ and side $c = 12$. Find the length of side b.



$a^2 + b^2 = c^2$	Use the Pythagorean theorem.
$8^2 + b^2 = 12^2$	Substitute the given values for a and c.
$64 + b^2 = 144$	Simplify the exponential expressions.
$b^2 = 80$	Solve the equation for b^2.
$\sqrt{b^2} = \sqrt{80}$	Take the square root of each side of the equation.
$b = 4\sqrt{5}$	Simplify each radical expression.

Show Work! on own Paper!

Each of the problems which follow refer to a right triangle ABC with $\angle C = 90°$.

1. Given side $a = 3$ and side $b = 4$, find the length of side c. _____
2. Given side $a = 6$ and side $b = 3$, find the length of side c. _____
3. Given side $b = 4$ and side $c = 6$, find the length of side a. _____
4. Given side $a = 12$ and side $c = 13$, find the length of side b. _____
5. Given side $a = 9$ and side $b = 3$, find the length of side c. _____
6. Given side $b = 8$ and side $c = 10$, find the length of side a. _____
7. Given side $a = 14$ and side $c = 16$, find the length of side b. _____
8. Given side $a = \sqrt{2}$ and side $b = 1$, find the length of side c. _____
9. Given side $b = \sqrt{3}$ and side $c = 3$, find the length of side a. _____
10. Given side $a = 4$ and side $c = 3\sqrt{2}$, find the length of side b. _____
11. Given side $a = 2\sqrt{3}$ and side $b = \sqrt{2}$, find the length of side c. _____

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Algebra and Geometry Review, page 25, Trigonometry

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Each of the problems Wh1Ch follow re er to - rlght mangle ABC wlth AC = 90°

1

2

3

7

10

:12 + bl C2 , Use the Pythagorean theorem.

82 bl 122 Substitute the given values for a and c.

64 144 Simplify the exponential expressions.

b2 SD Solve the equation for b2. .

W: Take the square root of each side of the equation.

b = 4 J?

Simpiify each radicai expression.

Given side a = 3 and side b = 4, find the length of side c.

Given side a = 6 and side I9 = 3, find the length of side c.

Given side b = 4 and side c = 6, find the iength of side a.

ii

Given side a = 9 and side b = 3, find the length of side c.

Given side b = 8 and side c = 10, find the length of side a.

Given side a = 14 and side c = 16, find the length of side b.

Given side a = and side b = 1, find the length of side c.

Giiren side b = J? and side c = 3, find the length of side a.

Given side a = 4 and side C = 3 find the length of side b.

Given side a = 25 and side b = find the length of side c.

Review 25

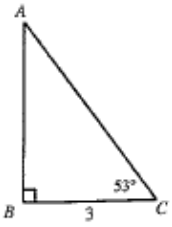
Name _____ Date _____

Practice: For use after Lesson 3.1, Trigonometry

Solving Right Triangles

Solve each right triangle ABC.

1.



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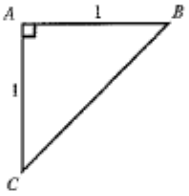

Solve each right triangle ABC ($\angle C = 90°$) given the information below.

4. $\angle A = 65°$, $c = 15$

5. $\angle B = 65°$, $a = 15$

6. $\angle B = 33°$, $b = 11$

7. $\angle A = 72°$, $b = 17$

8. $a = 27.3$, $b = 15.2$

9. $b = 17.2$, $c = 19.3$

10. For triangle ABC ($\angle C = 90°$), $\tan A = 3t$. Express the other five trigonometric functions of $\angle A$ in terms of t.

Applications

11. The Great Pyramid is the largest of the three pyramids of Giza. The length of each side at the base is approximately 776 ft and the original height was 481 ft. Calculate the angle that each side of the pyramid makes with the ground to the nearest tenth of a degree.

12. A ladder makes a 52° angle with the ground. If the ladder rests against a building at a point that is 71 ft from the ground, what is the length of the ladder?

MIXED PRACTICE

13. State whether or not the relation {(1, 2), (2, 3), (3, 2)} is a function.

14. Find the amplitude, period, phase shift, and vertical shift for the function $y = -3 \sin\left(x + \frac{\pi}{2}\right) - 3$.

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Date

Name - Practice: For use after Lesson 3.1, Trigonometry

Solving Right Triangles

Solve each right tliangle ABC (LC = 90°) given the information below.

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