Lesson 7
Pythagorean Theorem
Finding Missing Side in Simplest Radical Form

Review Work: Put each in simplest radical form.

1) $\sqrt{45}$

$\sqrt{9}\sqrt{5}$

$3\sqrt{5}$

2) $3\sqrt{24}$

$3\sqrt{4}\sqrt{6}$

$6\sqrt{6}$

3) $5\sqrt{36}$

30

4) $4\sqrt{50}$

$4\sqrt{25}\sqrt{2}$

$20\sqrt{2}$

5) $\sqrt{27}$

$\sqrt{9}\sqrt{3}$

$3\sqrt{3}$

6) $10\sqrt{99}$

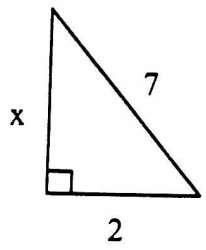
$10\sqrt{9}\sqrt{11}$

$10 \cdot 3\sqrt{11}$

$30\sqrt{11}$

Examples: Find the missing side in simplest radical form

1)



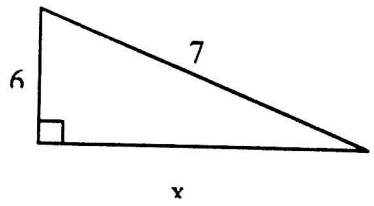
$x^2 + 4 = 49$

$\sqrt{x^2} = \sqrt{45}$

$x = \sqrt{9}\sqrt{5}$

$x = 3\sqrt{5}$

2)



$x^2 + 36 = 49$

$\sqrt{x^2} = \sqrt{13}$

$x = \sqrt{13}$

Two lengths of a right triangle are given. Find the third length in simplest radical form.

3) a = 9, b = 12

$x = 15$

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

$9^2 + 12^2 = c^2$

$\sqrt{225} = \sqrt{c^2}$

$c = 15$

4) a = 7, c = 8

$b = \sqrt{15}$

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

$7^2 + x^2 = 8^2$

$49 + x^2 = 64$

$-49 \quad -49$

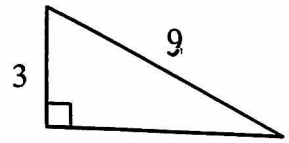
$\sqrt{x^2} = \sqrt{15}$

$x = \sqrt{15}$

Try These:

Find the missing side in simplest radical form

1)



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

$x^2+3^2=9^2$

$x^2+9=81$

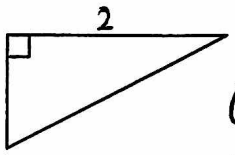
$-9 \quad -9$

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

$x=\sqrt{36}\sqrt{2}$

$x=6\sqrt{2}$

2)



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

$1^2+2^2=c^2$

$1+4=c^2$

$\sqrt{5}=\sqrt{c^2}$

$c=\sqrt{5}$

Two lengths of a right triangle are given. Find the third length in simplest radical form.

3) a = 7, c = 13

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

$7^2+x^2=13^2$

$49+x^2=169$

$-49 \quad -49$

$\sqrt{x^2}=\sqrt{120}$

$\sqrt{4}\sqrt{30}$

$x=2\sqrt{30}$

4) a = 3, b = 9

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

$3^2+9^2=x^2$

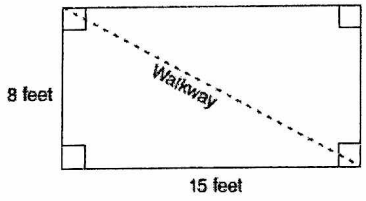
$9+81=x^2$

$\sqrt{90}=\sqrt{x^2}$

$\sqrt{9}\sqrt{10}$

$3\sqrt{10}=x$

5) Nancy's rectangular garden is represented in the diagram below.



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

$8^2+15^2=x^2$

$\sqrt{289}=\sqrt{x^2}$

$x=17$

If a diagonal walkway crosses her garden, what is its length, in feet?

1) 17

2) 22

3) $\sqrt{161}$

4) $\sqrt{529}$