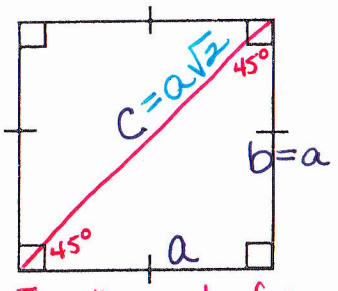
NOTES 9.2: 45° – 45° – 90° TRIANGLES



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

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

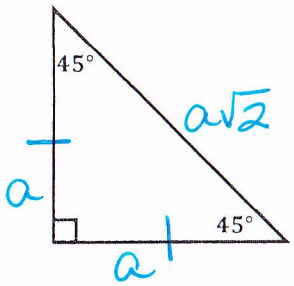
$2a^2 = c^2$

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

$a\sqrt{2} = c$

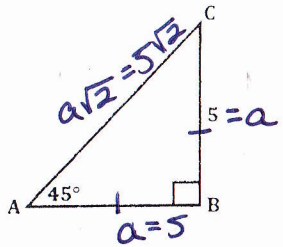
The diagonal of a square cuts it into 2 45°-45°-90° triangles!

So anytime you are solving for a missing length in a 45° – 45° – 90° triangle, label it like this:



EXAMPLES: Find the lengths of the missing sides.

1.

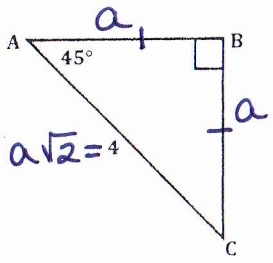


* Given a leg!

AB = 5

AC = $5\sqrt{2}$

2.



AB = $2\sqrt{2}$ BC = $2\sqrt{2}$

* Given the hypotenuse! Find a leg!

Solve this equation:

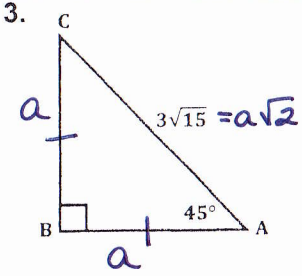
$\frac{a\sqrt{2}}{\sqrt{2}} = \frac{4}{\sqrt{2}}$

$a = \frac{4}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$a = \frac{4\sqrt{2}}{2}$

$a = 2\sqrt{2}$

3.



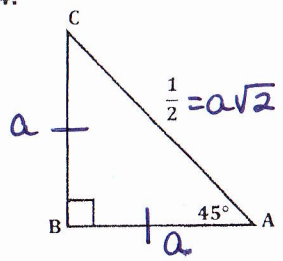
$\frac{3\sqrt{15}}{\sqrt{2}} = \frac{a\sqrt{2}}{\sqrt{2}}$

$\frac{\sqrt{2}}{\sqrt{2}} \cdot \frac{3\sqrt{15}}{\sqrt{2}} = a$

$\frac{3\sqrt{30}}{2} = a$

AB = $\frac{3\sqrt{30}}{2}$ BC = $\frac{3\sqrt{30}}{2}$

4.



$\left(\frac{1}{\sqrt{2}}\right)\frac{1}{2} = a\sqrt{2}\left(\frac{1}{\sqrt{2}}\right)$

$\frac{\sqrt{2}}{\sqrt{2}} \cdot \frac{1}{2\sqrt{2}} = a$

$\frac{\sqrt{2}}{4} = a$

AB = $\frac{\sqrt{2}}{4}$ BC = $\frac{\sqrt{2}}{4}$

1/31/17