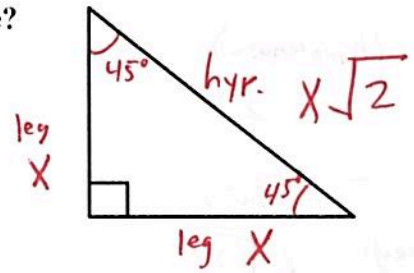
Key

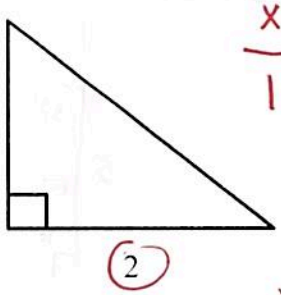
45 – 45 – 90 Triangles (Notes)

Definition:

the length of the hypotenuse is $\sqrt{2}$ times the length of the leg.

What does this look like?





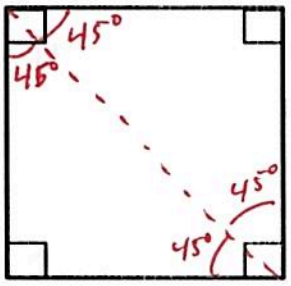
45	45	90
X	X	X √2
1	1	√2

$\frac{1}{2} = \frac{\sqrt{2}}{x}$

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

hyp $= 2\sqrt{2}$

Diagonal of a square creates 45-45-90 Triangles



Given: hyp = 5

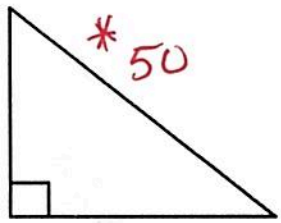
45	45	90
1	1	√2
x	1	5

$\frac{1}{x} = \frac{\sqrt{2}}{5}$

$\frac{5 \cdot 1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{5\sqrt{2}}{2}$

↑ Can't have √ in denominator. Rationalize by multiplying $\frac{\sqrt{2}}{\sqrt{2}}$

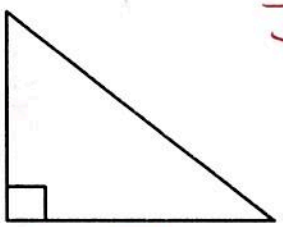
Practice problems: * Given



45	45	90
1	1	√2
x	1	50

$\frac{1}{x} = \frac{\sqrt{2}}{50}$

$\frac{50}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{50\sqrt{2}}{2} = 25\sqrt{2}$



45	45	90
1	1	√2
3√2	1	x

$\frac{3\sqrt{2}}{1} = \frac{\sqrt{2}}{x}$

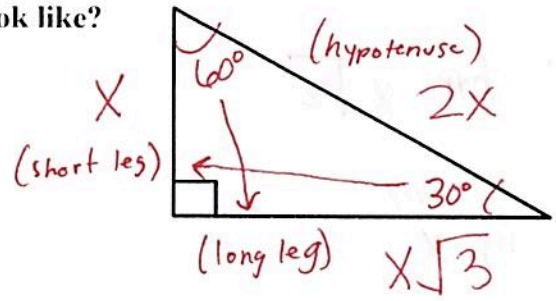
$3\sqrt{2} \cdot \sqrt{2} = 3 \cdot 2 = 6$

30 – 60 – 90 Triangles (Notes)

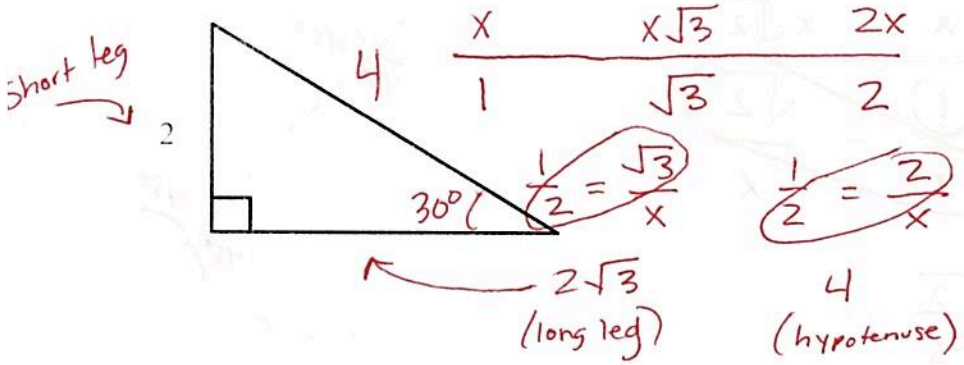
Definition: the length of the hypotenuse is 2 times the short leg and the length of the long leg is $\sqrt{3}$ times the short leg.

* Shortest leg is opposite smallest angle *

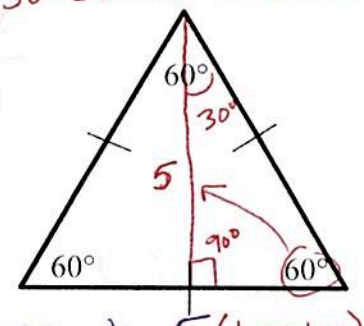
What does this look like?



30	60	90
X	X√3	2X
1	√3	2



* height of a equilateral triangle creates two 30-60-90 triangles

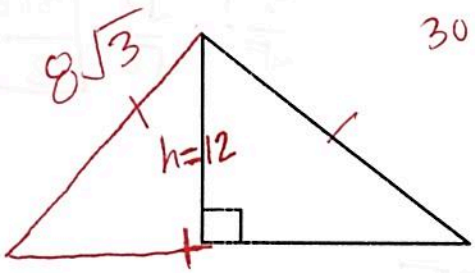


* Given = h = 5 (long leg)

$\frac{\sqrt{3}}{5} = \frac{2}{x}$

$\frac{10}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{10\sqrt{3}}{3}$ length of sides

Practice problems:

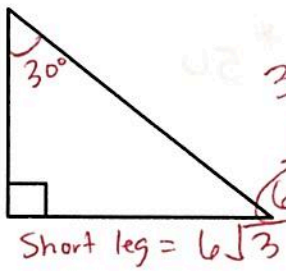


30 60 90

$\frac{\sqrt{3}}{12} = \frac{2}{x}$

$\frac{12 \cdot 2}{\sqrt{3}} = \frac{24}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$= \frac{24\sqrt{3}}{3} = 8\sqrt{3}$



30	60	90
1	√3	2

Short leg = $6\sqrt{3}$

$hyp = 6\sqrt{3} \cdot \sqrt{3} = 6 \cdot 3 = 18$

long leg = $6\sqrt{3} \cdot 2 = 12\sqrt{3}$