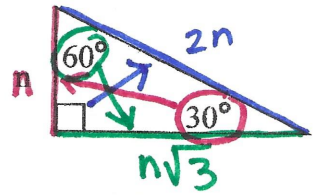
Special Right Triangles

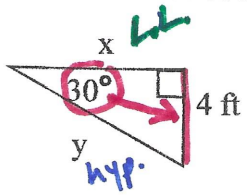
30° – 60° – 90° Δ



If the short leg (opposite the 30°) is n units, then the long leg (opposite the 60°) is n·√3 units, and the hypotenuse (opposite the right angle) is 2·n units.

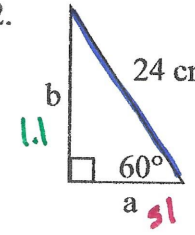
Find the measures of all sides of each triangle. Leave answers in exact form.

1.



30° – 60° – 90° Δ
SL: n = 4 ft
LL: n√3 = 4√3 ft
Hyp: 2n = 2·4 = 8 ft
x = 4√3 ft; y = 8 ft

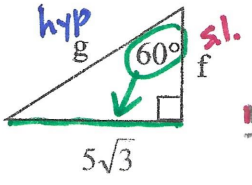
2.



$\frac{2n}{2} = \frac{24}{2}$
n = 12

30° – 60° – 90° Δ
SL: n = 12 cm
LL: n√3 = 12√3 cm
Hyp: 2n = 24 cm
a = 12 cm; b = 12√3 cm

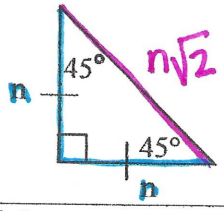
3.



$\frac{n\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{\sqrt{3}}$
n = 5

30°-60°-90° Δ
short leg: n = 5u
long leg: n√3 = 5√3 u
hyp: 2n = 2(5) = 10u
f = 5u; g = 10u

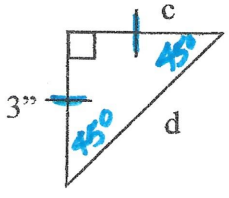
45° – 45° – 90° Δ



This triangle is called an Isosceles Right triangle. Both legs are CONGRUENT. If the legs are both *n* units, then the hypotenuse is n·√2 units by the Pythagorean Thm.

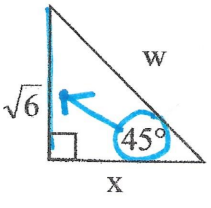
Find the measures of all sides of each triangle. Leave answers in exact form.

1.



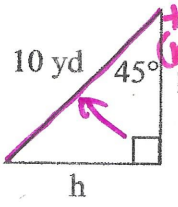
45° – 45° – 90° Δ
Leg: n = 3"
Hyp: n√2 = 3√2 in
c = 3"
d = 3√2 in

2.



45° – 45° – 90° Δ
Leg: n = √6 u
Hyp: n√2 = √6·√2 = √3·2·2
= 2√3 u
w = 2√3 u
x = √6 u

3.



*Rationalize the Denominator (multiply by form of 1)

$\frac{n\sqrt{2}}{\sqrt{2}} = \frac{10}{\sqrt{2}}$

$n = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{10\sqrt{2}}{2} = 5\sqrt{2}$

45°-45°-90° Δ
legs: n = 5√2 yds
hyp: n√2 = 10 yds
h = 5√2 yds
k = 5√2 yds