Name: _____ Hour: _____ Date: _____

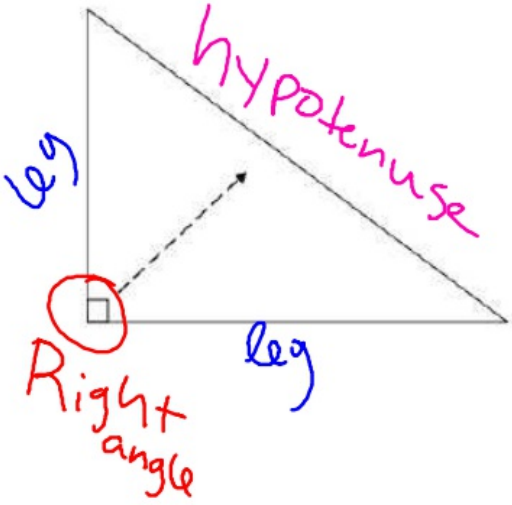
$45° - 45° - 90°$ Special Right Triangles Notes

In middle school you learn some information about right triangles...

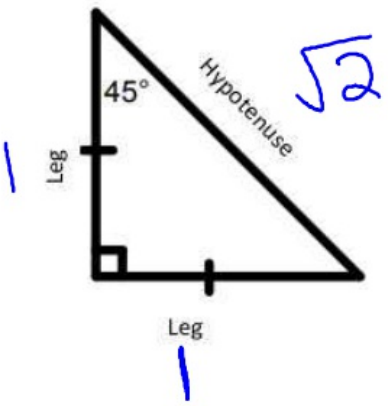
Recall the Parts of a Right Triangle:

- Right Angle: a 90° angle

- Legs: the sides that make up the right angle
- Hypotenuse:
  - longest side
  - opposite of the right angle.



A right triangle that has angle measures of $45° - 45° - 90°$ is a "special right triangle". There is a pattern that allows us to know the value of the sides of triangles with little to no calculations!



Hypotenuse = $leg \cdot \sqrt{2}$

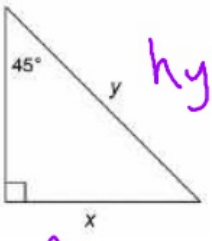
Leg = $\frac{hypotenuse}{\sqrt{2}}$

***** Fun Facts about the $45° - 45° - 90°$ Triangle *****

- The legs are congruent
- 45-45-90 triangles are isoceles

Examples: Use the pattern defined on the opposite side of this page to determine the missing side lengths of each of the following triangles.

1)



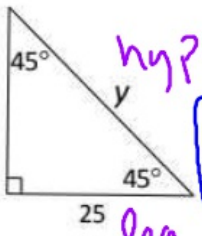
leg hyp.

leg

$x = 3$

$y = 3\sqrt{2}$

2)



leg hyp

leg

$x = 25$

$y = 25\sqrt{2}$

3)

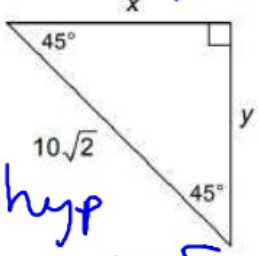
leg leg

hyp

$y = 2\sqrt{3}$

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

4)



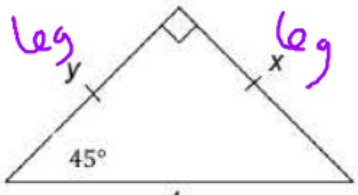
leg

leg

hyp

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

5)



hyp

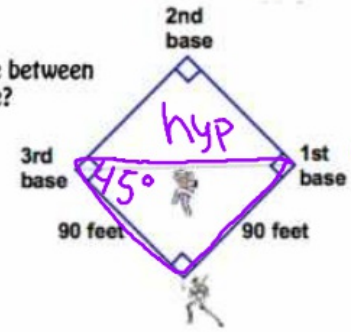
$y = 10$

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

$y = 2\sqrt{2}$

6)

What is the distance between 1st base and 3rd base?



$90\sqrt{2}$ feet