① $\sqrt{5} \cdot \sqrt{10} = \sqrt{5 \cdot 10} = \sqrt{50} = \sqrt{2 \cdot 25}$

$1, 4, 9, 16, 25, 36, 49, \ldots$

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

$= 5\sqrt{2}$

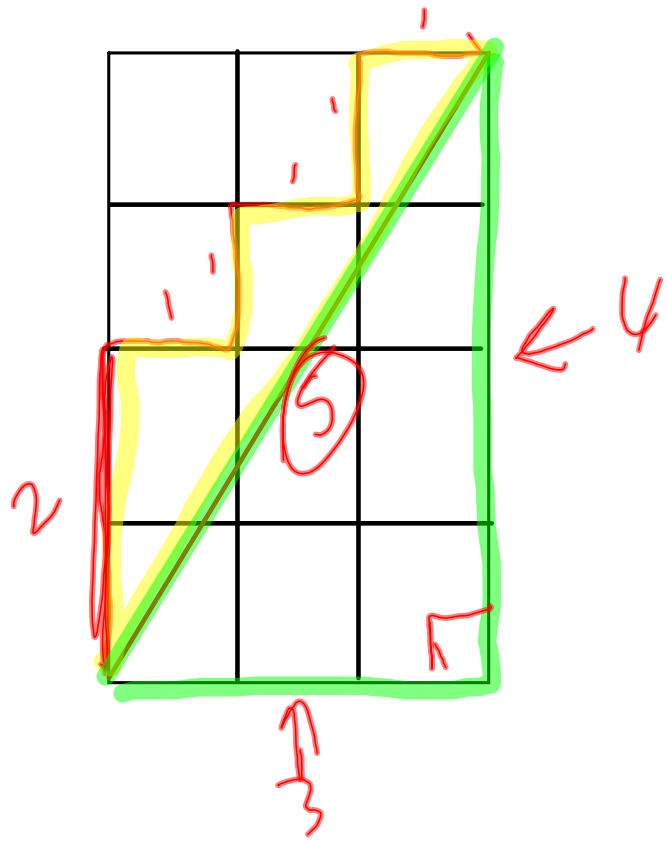
⑪ $28 \div \sqrt{8} = \frac{28}{\sqrt{8}} = \frac{28}{\sqrt{2 \cdot 4}} = \frac{28}{\sqrt{2} \cdot \sqrt{4}} = \frac{28}{2\sqrt{2}} = \frac{14}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{14\sqrt{2}}{2} = 7\sqrt{2}$

㉑ $\sqrt{\frac{25}{20}} = \sqrt{\frac{5}{4}} = \frac{\sqrt{5}}{\sqrt{4}} = \frac{\sqrt{5}}{2}$

⑬ $\sqrt{12} \cdot \sqrt{2} = \sqrt{12 \cdot 2} = \sqrt{24} = \sqrt{4 \cdot 6} = \sqrt{4} \cdot \sqrt{6} = 2\sqrt{6}$

ry 363
#62



pg 361
#13

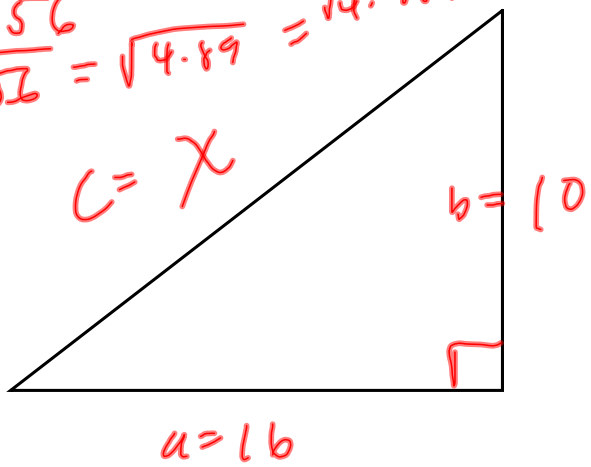
$16^2 + 10^2 = x^2$

$256 + 100 = x^2$

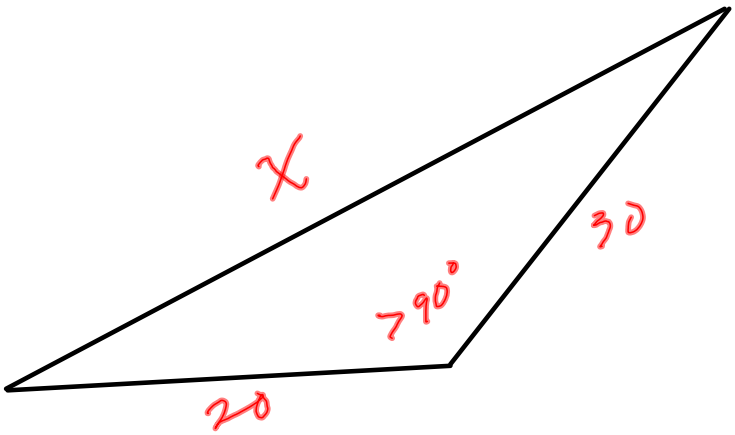
$x^2 = 356$

$x = \sqrt{356} = \sqrt{4 \cdot 89} = \sqrt{4} \cdot \sqrt{89} = 2\sqrt{89}$

$1, 4, 9, 16, 25, 36, 49, 64, 81$



pg 364
#72



Two special right triangles determined by ∠ measures

Two special right triangles determined by ∠ measures

45-45-90

Two special right triangles determined by ∠ measures

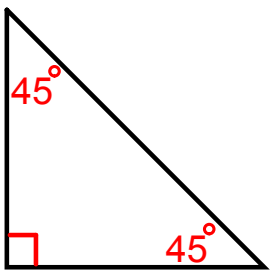
45-45-90

30-60-90

Two special right triangles determined by ∠ measures

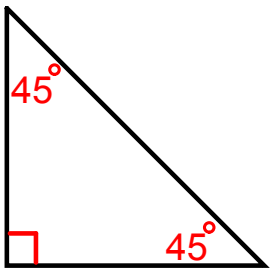
45-45-90

30-60-90

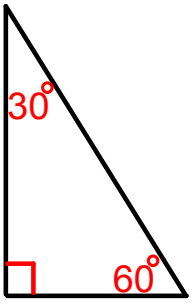


Two special right triangles determined by ∠ measures

45-45-90

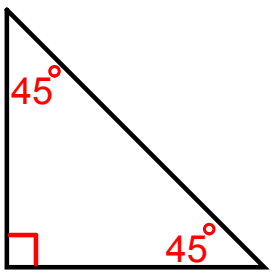


30-60-90

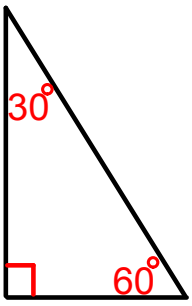


Two special right triangles determined by ∠ measures

45-45-90



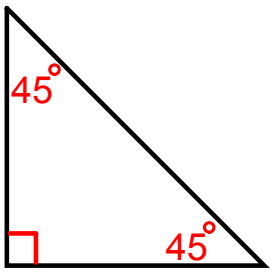
30-60-90



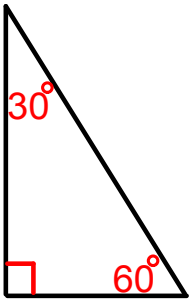
The sides of each Δ are <u>always</u> in a specific ratio...

Two special right triangles determined by ∠ measures

45-45-90



30-60-90

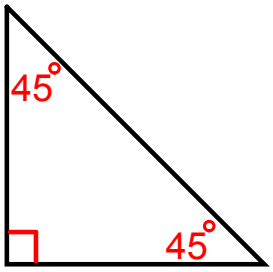


The sides of each Δ are <u>always</u> in a specific ratio...

Your task is to figure out the side ratio for each Δ.

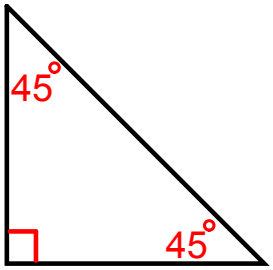
Side length ratios for a 45-45-90 Δ

45-45-90



Side length ratios for a 45-45-90 Δ

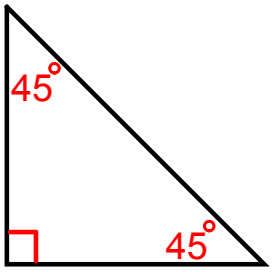
45-45-90



Hints...

Side length ratios for a 45-45-90 Δ

45-45-90

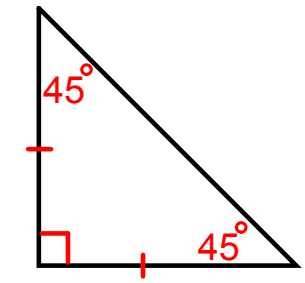


Hints...

- Give shortest side a convienent length

Side length ratios for a 45-45-90 Δ

45-45-90



Hints...

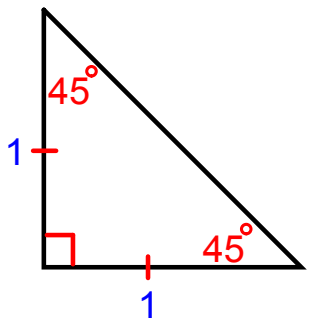
- Give shortest side a convienent length

Side length ratios for a 45-45-90 Δ

45-45-90

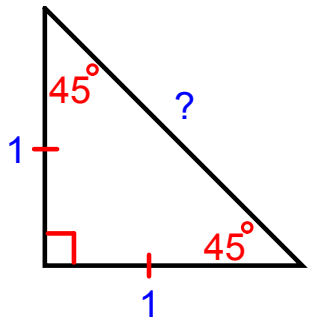
Hints...

- Give shortest side a convienent length



Side length ratios for a 45-45-90 Δ

45-45-90

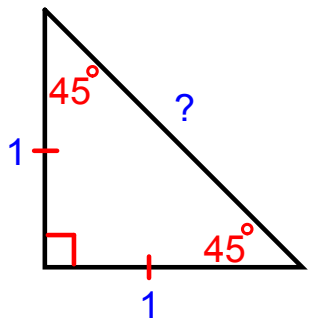


Hints...

- Give shortest side a convienent length

Side length ratios for a 45-45-90 Δ

45-45-90

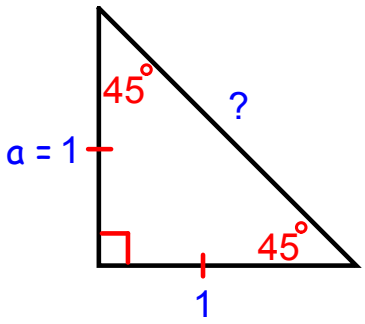


Hints...

- Give shortest side a convienent length
- Use Pythag Thm

Side length ratios for a 45-45-90 Δ

45-45-90

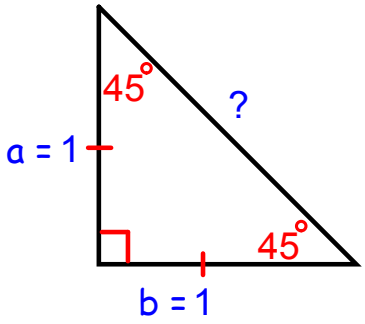


Hints...

- Give shortest side a convienent length
- Use Pythag Thm

Side length ratios for a 45-45-90 Δ

45-45-90

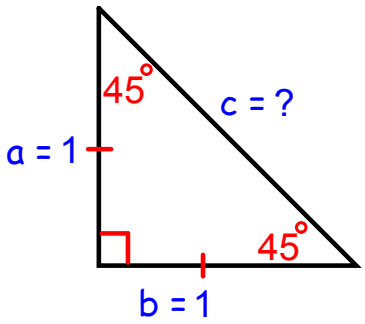


Hints...

- Give shortest side a convienent length
- Use Pythag Thm

Side length ratios for a 45-45-90 Δ

45-45-90

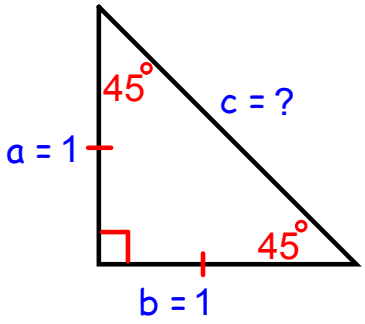


Hints...

- Give shortest side a convienent length
- Use Pythag Thm

Side length ratios for a 45-45-90 Δ

45-45-90



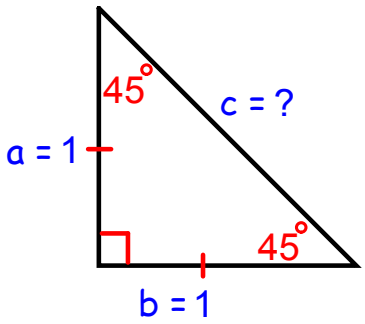
Hints...

- Give shortest side a convienent length
- Use Pythag Thm

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

Side length ratios for a 45-45-90 Δ

45-45-90



Hints...

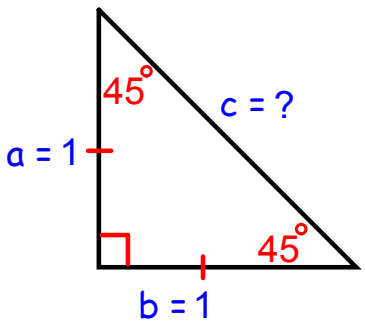
- Give shortest side a convienent length
- Use Pythag Thm

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

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

Side length ratios for a 45-45-90 Δ

45-45-90



Hints...

- Give shortest side a convienent length
- Use Pythag Thm

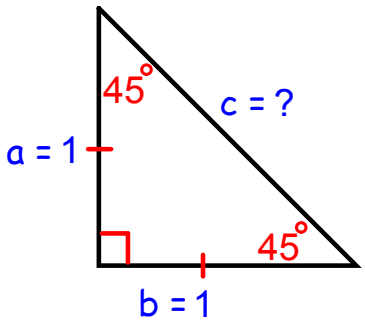
$c^2 = a^2 + b^2$

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

$c^2 = 2$

Side length ratios for a 45-45-90 Δ

45-45-90



Hints...

- Give shortest side a convienent length
- Use Pythag Thm

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

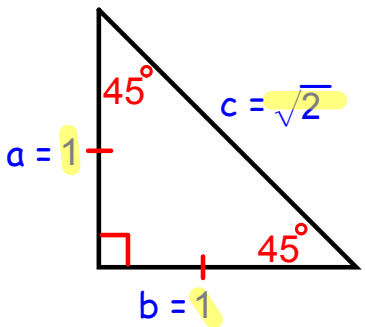
$c^2 = 1^2 + 1^2$

$c^2 = 2$

$c = \sqrt{2}$

Side length ratios for a 45-45-90 Δ

45-45-90



Hints...

- Give shortest side a convienent length
- Use Pythag Thm

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

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

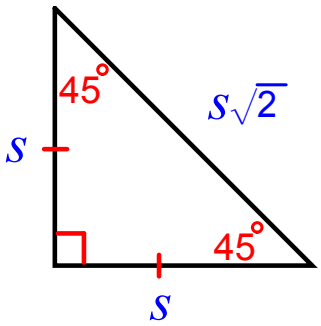
$c^2 = 2$

$c = \sqrt{2}$

Thm 7-8: 45-45-90 Δ

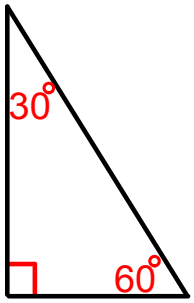
45-45-90

hyp = $\sqrt{2}$ * leg



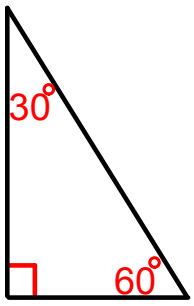
Side length ratios for a 30-60-90 Δ

30-60-90



Side length ratios for a 30-60-90 Δ

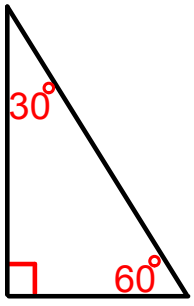
30-60-90



Hints...

Side length ratios for a 30-60-90 Δ

30-60-90

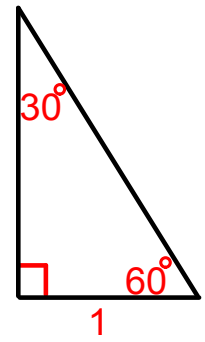


Hints...

- Give shortest side a convienent length

Side length ratios for a 30-60-90 Δ

30-60-90

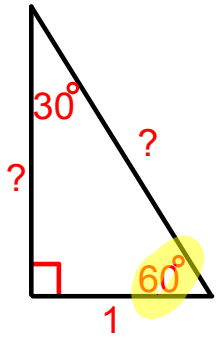


Hints...

- Give shortest side a convienent length

Side length ratios for a 30-60-90 Δ

30-60-90

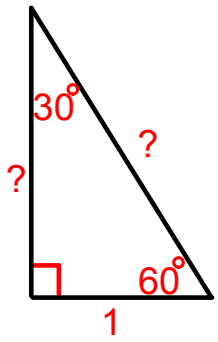


Hints...

- Give shortest side a convienent length

Side length ratios for a 30-60-90 Δ

30-60-90

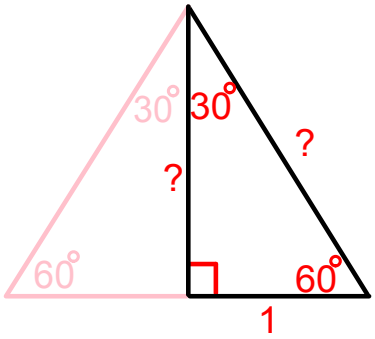


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

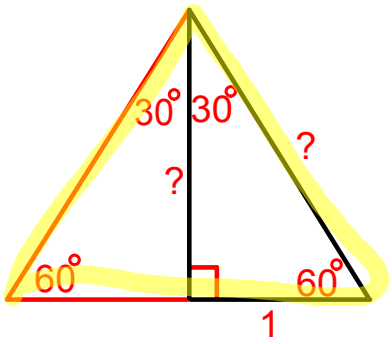


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

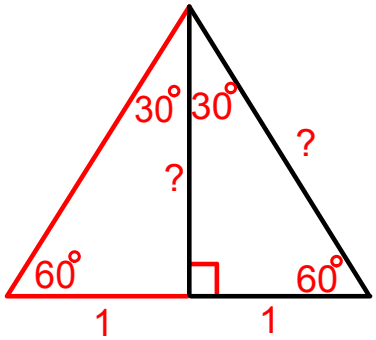


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

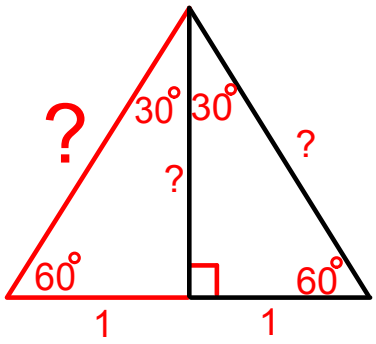


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

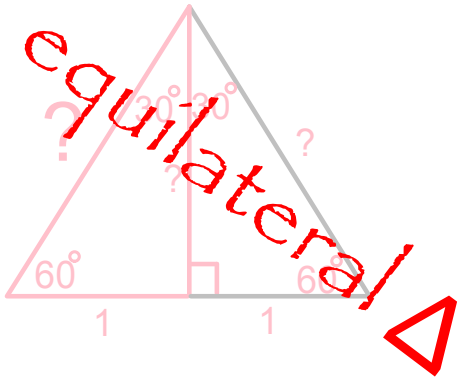


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

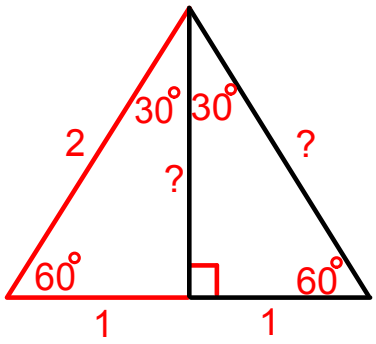


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

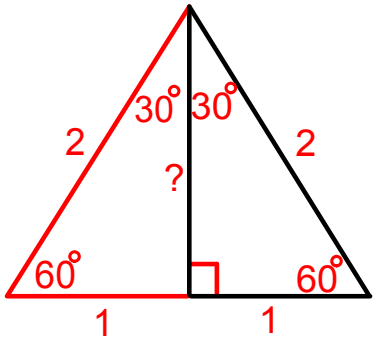


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

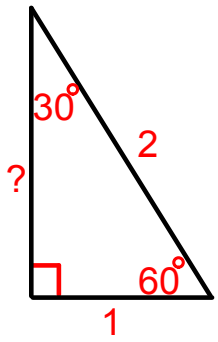


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

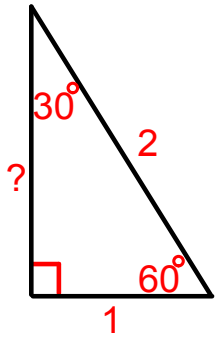


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?

Side length ratios for a 30-60-90 Δ

30-60-90

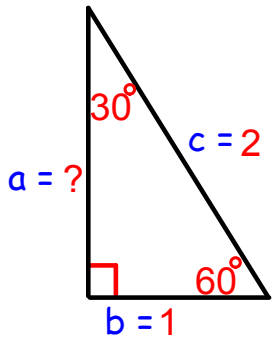


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

Side length ratios for a 30-60-90 Δ

30-60-90

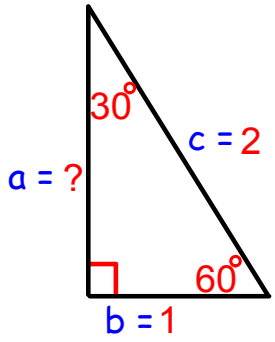


Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

Side length ratios for a 30-60-90 Δ

30-60-90



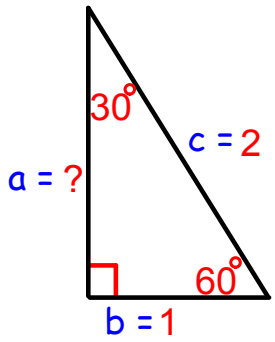
Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

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

Side length ratios for a 30-60-90 Δ

30-60-90



Hints...

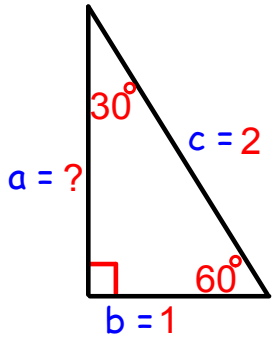
- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

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

$2^2 = a^2 + 1^2$

Side length ratios for a 30-60-90 Δ

30-60-90



Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

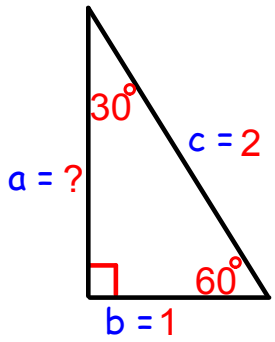
$c^2 = a^2 + b^2$

$2^2 = a^2 + 1^2$

$4 = a^2 + 1$

Side length ratios for a 30-60-90 Δ

30-60-90



Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

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

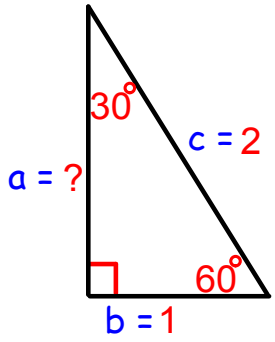
$2^2 = a^2 + 1^2$

$4 = a^2 + 1$

$a^2 = 3$

Side length ratios for a 30-60-90 Δ

30-60-90



Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

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

$2^2 = a^2 + 1^2$

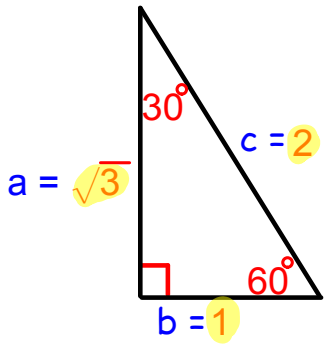
$4 = a^2 + 1$

$a^2 = 3$

$a = \sqrt{3}$

Side length ratios for a 30-60-90 Δ

30-60-90



Hints...

- Give shortest side a convienent length
- Is the 30-60-90 Δ ½ of something?
- Use Pythag Thm

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

$2^2 = a^2 + 1^2$

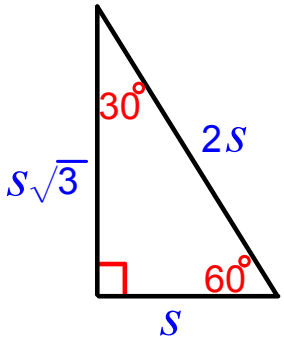
$4 = a^2 + 1$

$a^2 = 3$

$a = \sqrt{3}$

Thm 7-9: 30-60-90 Δ

30-60-90

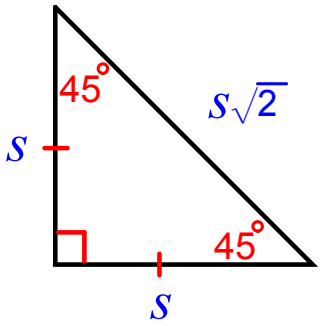


hyp = 2 * shorter leg

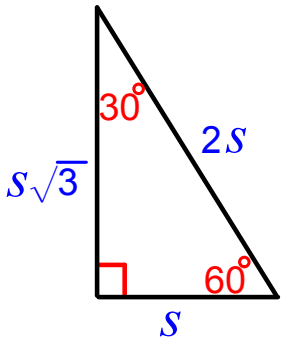
longer leg = $\sqrt{3}$ * shorter leg

The two special right triangles

45-45-90
(Thm 7-8)



30-60-90
(Thm 7-9)

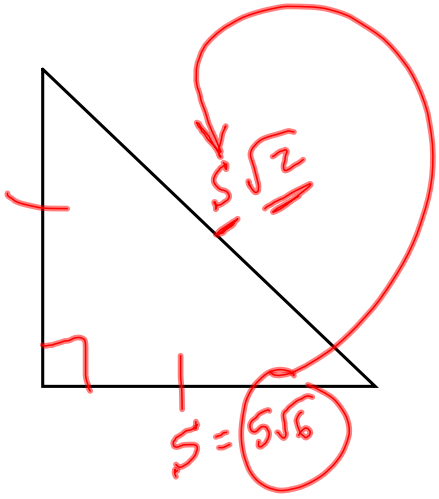


Tips...

- Mental math is much faster than using a calculator.
- For these probs, answers almost always left in radical form.
- Do not leave a root/radical in the denominator of a fraction.
- First find shorter leg when working with a 30-60-90.

Example 1

Find length of the hypotenuse of a 45-45-90 Δ w/legs of length $5\sqrt{6}$.

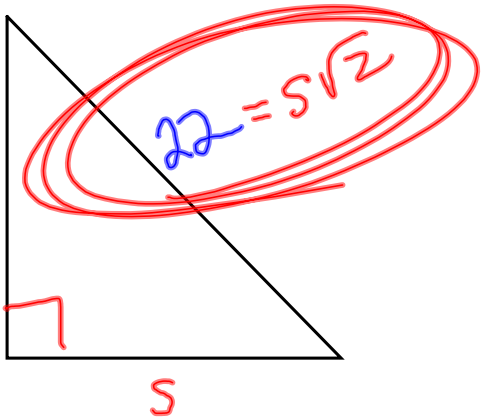


$\sqrt{300} = \sqrt{100 \cdot 3}$
$= \sqrt{100} \cdot \sqrt{3}$
$10\sqrt{3}$

s
$(5\sqrt{6})(\sqrt{2})$
$5\sqrt{6}\sqrt{2} = 5\sqrt{6 \cdot 2}$
$= 5\sqrt{12}$
$= 5\sqrt{4 \cdot 3}$
$= 5 \cdot 2 \cdot \sqrt{3}$
$= 10\sqrt{3}$

Example 2

Find length of leg of a 45-45-90 Δ w/hypotenuse of length 22.



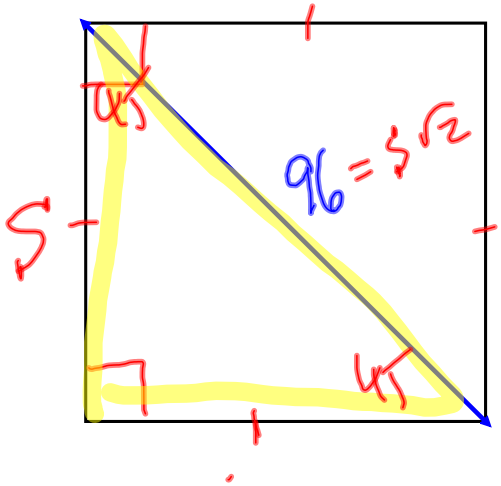
$\frac{22}{\sqrt{2}} = \frac{s\sqrt{2}}{\sqrt{2}}$

$s = \frac{22}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{22\sqrt{2}}{2}$

$= 11\sqrt{2}$

Example 3

The distance from 1 corner of a square playground to the opposite corner is 96ft. To the nearest foot, how long is each side of the playground? 68



$\frac{96}{\sqrt{2}} = \frac{s\sqrt{2}}{\sqrt{2}}$

$s = \frac{96}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{96\sqrt{2}}{2}$

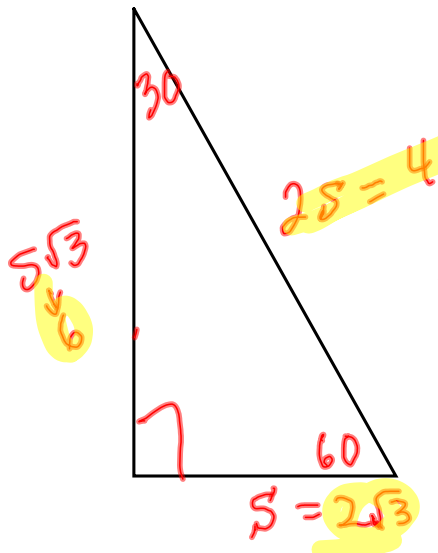
$= 48\sqrt{2}$

$= 67.88225$

≈ 68

Example 4

Find lengths of the legs of a 30-60-90 Δ w/hypotenuse of length $4\sqrt{3}$.



$\frac{2s}{2} = \frac{4\sqrt{3}}{2}$

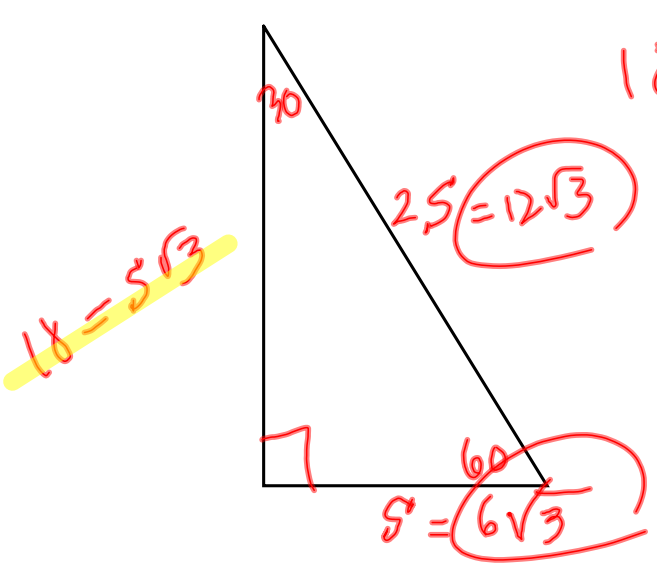
$s = 2\sqrt{3}$

$s\sqrt{3} = (2\sqrt{3})(\sqrt{3})$

$2 \cdot 3 = 6$

Example 5

The longer leg of a 30-60-90 has length 18. Find the lengths of the shorter leg and hypotenuse.



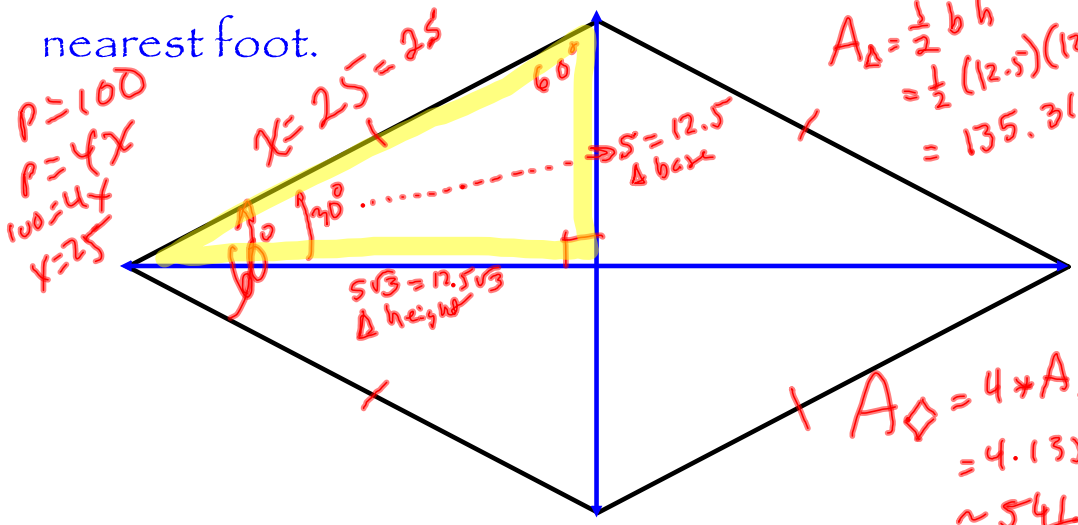
$18 = 5\sqrt{3}$

$5 = \frac{18}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{18\sqrt{3}}{3}$

$= 6\sqrt{3}$

Example 6

A garden shaped like a rhombus has a perimeter of 100ft & a 60°∠. Find the area of the garden to the nearest foot.



$A_\Delta = \frac{1}{2} b h$

$= \frac{1}{2} (12.5)(12.5\sqrt{3})$

$= 135.316$

$A_\Diamond = 4 * A_\Delta$

$= 4 \cdot 135.316$

≈ 541.26

≈ 541

L7-3 HW Problems

Pg 369 #1-29, 32, 33-39

Pg 372 #1-10