

BE - Geometry I | Monday 11-8-10

Find the discriminant and state what it tells you about the solution of the quadratic equation.

① $x^2 + 3x - 3 = 0$

② $-3x^2 - 5x = -2$

③ $x^2 - x + 6 = 0$

④ $9x^2 - 6x - 4 = -5$

$x = \frac{-b \pm \sqrt{d}}{2a}$ * Key is here *

① $d = 21$, 2 irrational roots

② $d = 49$, 2 rational roots

③ $d = -23$, no real roots

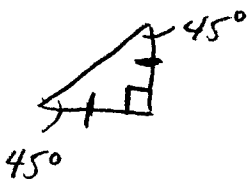
④ $d = 0$, 1 rational root

Ch. 7-3 Two SPECIAL Right Triangles

30-60-90




45-45-90



(Isosceles Right Δ)

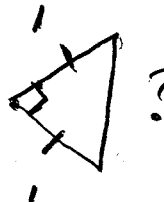
WHAT THE SCREWCROW SAID:

"The sum of the squares root of any two sides of an isosceles triangle is equal to the square root of the remaining side"

Is ~~abe~~ (EX)  $\sqrt{1^2 + 1^2} \neq \sqrt{3}$

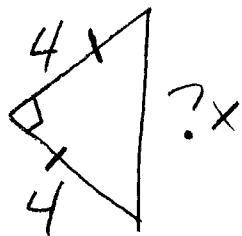
How could you fix the SCREWCROW'S MATH?

Insert "Right" before isosceles

(EX)  ? $\sqrt{1^2 + 1^2} = \sqrt{2}$

Theorem 7.6 In any 45-45-90 Δ ,
the hypotenuse is
 $\sqrt{2}$ times the length of
A leg.

(Ex)



?x

$$4^2 + 4^2 = x^2$$

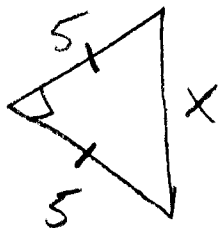
$$32 = x^2$$

$$\sqrt{32} = x$$

216

$$4\sqrt{2} = x \quad \checkmark$$

(Ex)



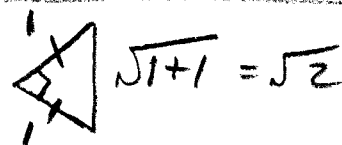
$$x = 5\sqrt{2}$$

Check: $\sqrt{5^2 + 5^2} = \sqrt{x^2}$

$$x = \sqrt{50} = \sqrt{25\sqrt{2}}$$

$$= 5\sqrt{2} \quad \checkmark$$

Memory Aid: 1, 1, $\sqrt{2}$

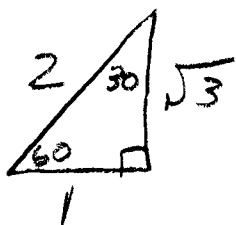


$$\sqrt{1+1} = \sqrt{2}$$

Theorem 7.7 In any 30-60-90 Δ ,
the sides are in a
proportion of $1 : \sqrt{3} : 2$

\uparrow \uparrow \uparrow
 Shortest Between longest
 side 1 and 2 side
 \Rightarrow hypotenuse

(EX)

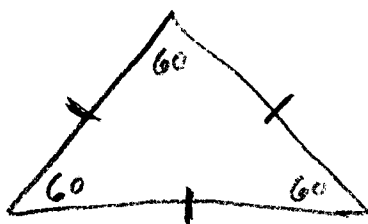


CK: $(\sqrt{3})^2 + 1^2 = 2^2$

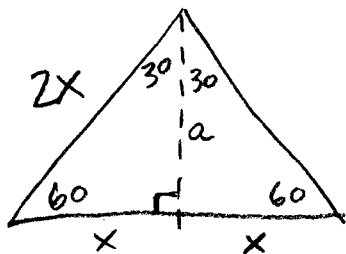
$3 + 1 = 4 \checkmark$

Memory Aid: $1, 2, \sqrt{3}$
 \uparrow
 Longest

Another Proof



Equilateral



$$(2x)^2 - x^2 = a^2$$

$$4x^2 - x^2 = a^2$$

$$3x^2 = a^2$$

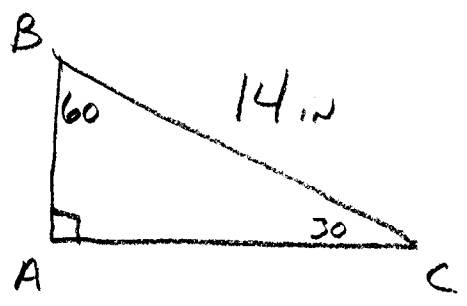
$$\sqrt{3}x = a$$

Summary of 30-60-90 Δ

- The hypotenuse is 2 times the SHORT SIDE (opposite 30° angle)
- The "middle" side is $\sqrt{3}$ times the SHORT SIDE.

EX3
PG 339

FIND AC

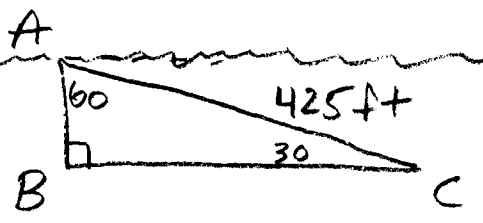


AC is the middle leg, it is $\sqrt{3} \cdot AB$

AB is $\frac{1}{2}$ of 14 = 7 in.

$$\therefore AC = 7\sqrt{3}$$

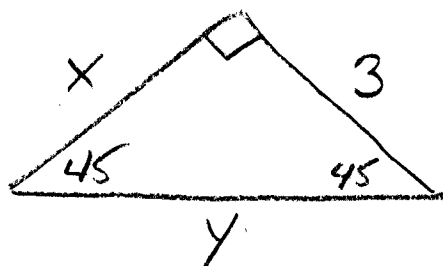
EX FIND AB



$$AB = \frac{1}{2} \cdot 425 = 212.5 \text{ ft}$$

WHEN my sub did "Angles and dangles" $\Rightarrow 30^\circ \updownarrow$,
 THE Bow WAS ALREADY 212.5 ft down!

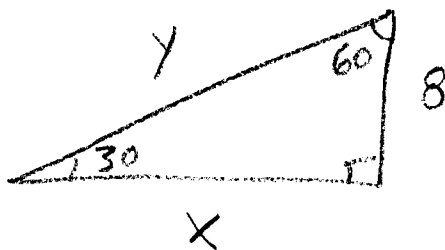
⊙ EX Find X and Y



$$y = \sqrt{2} \cdot 3 = \boxed{3\sqrt{2}}$$

$$\boxed{x = y = 3}$$

⊙ EX Find X and Y



$$y = 2 \cdot 8 = 16$$

$$x = \sqrt{3} \cdot 8 = 8\sqrt{3}$$

Homework: Pg 360 #12-19.