Semester 2 Notes: Week 10 – Week 17 (03/15/21 – 05/07/21)

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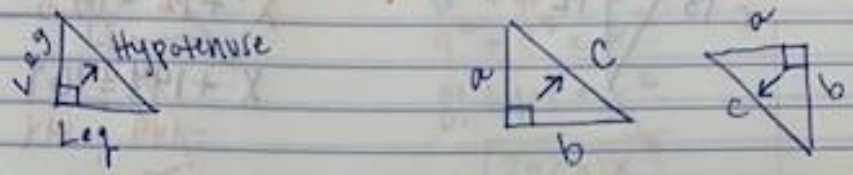
Lesson One

The Pythagorean Theorem

- I can use the pythagorean theorem to find the missing length of a △.



* The hypotenuse is always side c *

The pythagorean theorem : $a^2 + b^2 = c^2$

Exponent Review

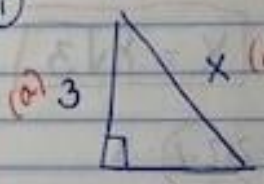
$X^2 = X \cdot X$

$4^2 = 4 \cdot 4 = 16$

$-6^2 = -6 \cdot -6 = 36$

Examples

①



Find x

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

$3^2 + 4^2 = x^2$

$9 + 16 = x^2$

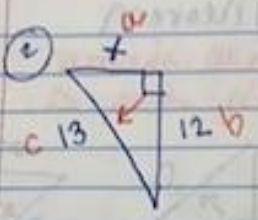
$\sqrt{25} = \sqrt{x^2}$

$5 = x$

$2\sqrt{x}$

* opposite of x^2 is $\sqrt{x}$ *

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

② 

Find x

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

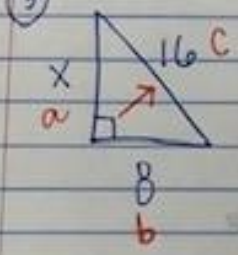
$x^2+12^2=13^2$

$x^2+144=169$

$-144 \quad -144$

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

$\boxed{x=5}$

③ 

Find x

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

$x^2+8^2=16^2$

$x^2+64=256$

$-64 \quad -64$

$\sqrt{x^2}=\sqrt{192}$

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

$\sqrt{192}$

$8 \cdot 24$

$2 \cdot 4 \quad 3 \cdot 8$

$2 \cdot 2 \quad 4 \cdot 2$

$2 \cdot 2 \quad 2 \cdot 2$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$

$(2 \cdot 2)(2 \cdot 2)(2 \cdot 2) \cdot 3$

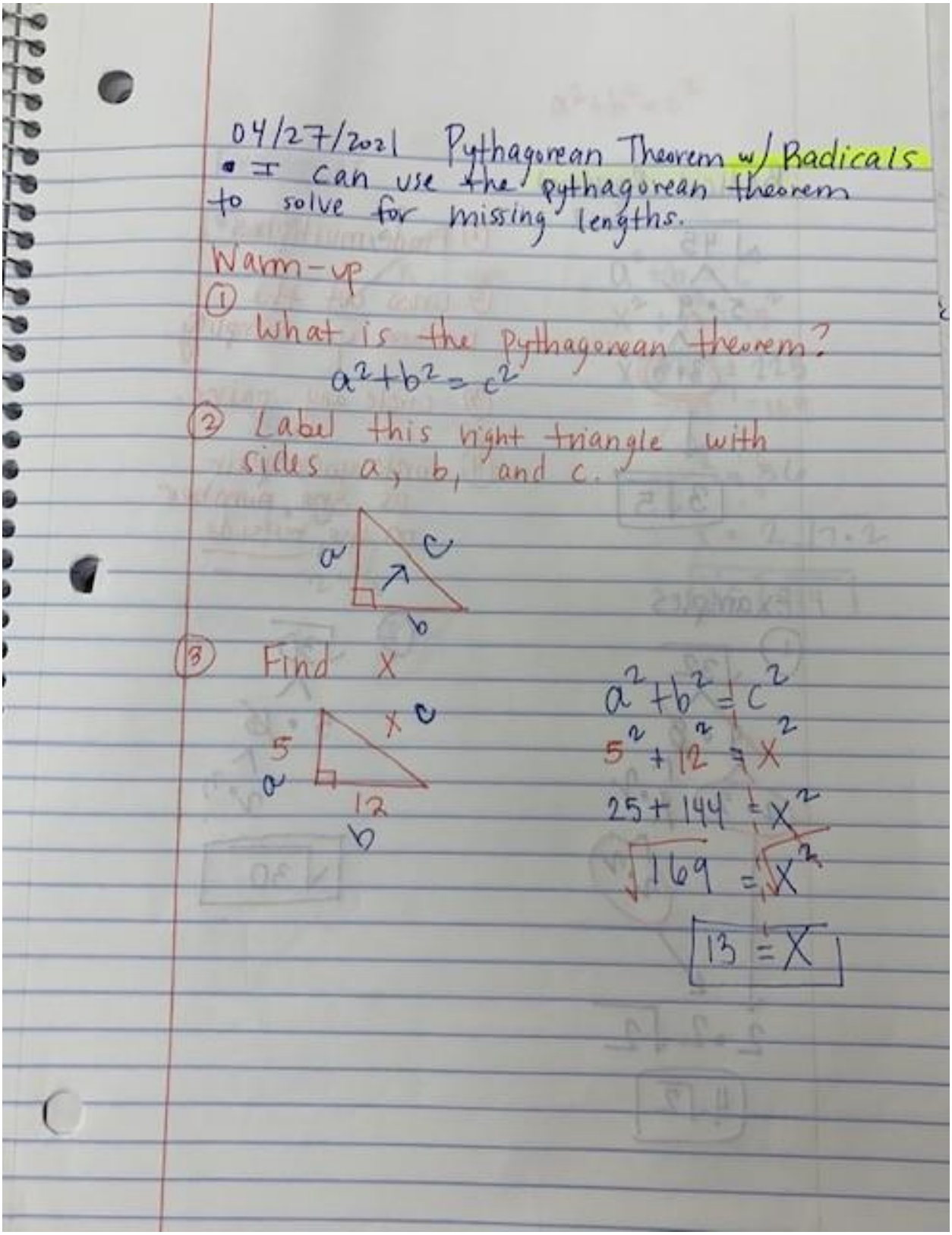
$\downarrow \quad \downarrow \quad \downarrow$

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

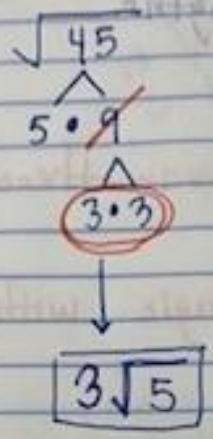
$8\sqrt{3}$

13, 5, 4, 6

Lesson Two


04/27/2021 Pythagorean Theorem w/ Radicals
• I can use the pythagorean theorem to solve for missing lengths.
Warm-up
① What is the pythagorean theorem?
$a^2+b^2=c^2$
② Label this right triangle with sides a, b, and c.
a
c
b
③ Find X
5
X
12
$a^2+b^2=c^2$
$5^2+12^2=X^2$
$25+144=X^2$
$\sqrt{169}=\sqrt{X^2}$
$13=X$

Radical Review



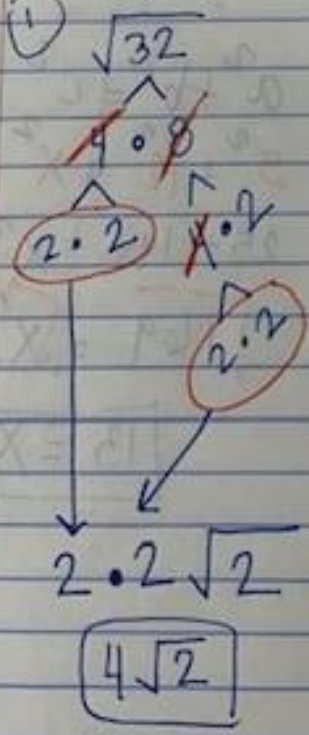
① Find multiples

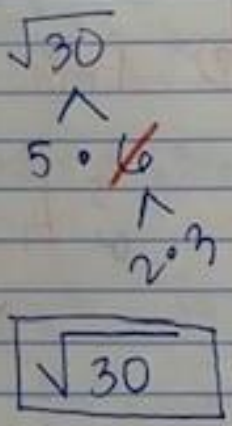
② Cross out the numbers you simplify.

③ circle any pairs.

④ write your pair as one number on the outside

Examples

① 

② 

Lesson Three

4/28/21 Types of Triangles

- I can determine if a triangle is acute, right, or obtuse.

*Formulas:

$a^2 + b^2 > c^2 \rightarrow$ Acute △

$a^2 + b^2 = c^2 \rightarrow$ Right △

$a^2 + b^2 < c^2 \rightarrow$ Obtuse △

* c is always your longest side *

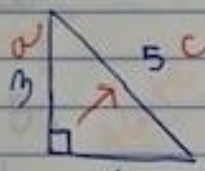
① 7, 8, 9
a b c

$a^2 + b^2 \_\_ c^2$

$7^2 + 8^2 \_\_ 9^2$

$49 + 64 \_\_ 81$

$113 > 81$ Acute

② 

$a^2 + b^2 \_\_ c^2$

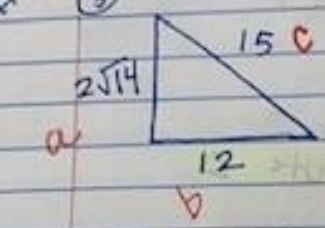
$3^2 + 4^2 \_\_ 5^2$

$9 + 16 \_\_ 25$

$25 = 25$

Right

#5 ③ Example



$a^2 + b^2 \_\_ c^2$

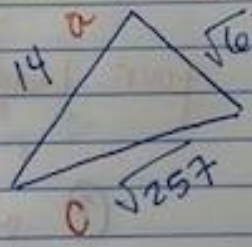
$(2\sqrt{14})^2 + 12^2 \_\_ 15^2$

$(2)(14) + 144 \_\_ 225$

$28 + 144 \_\_ 225$

Obtuse $172 < 225$

#6 ④



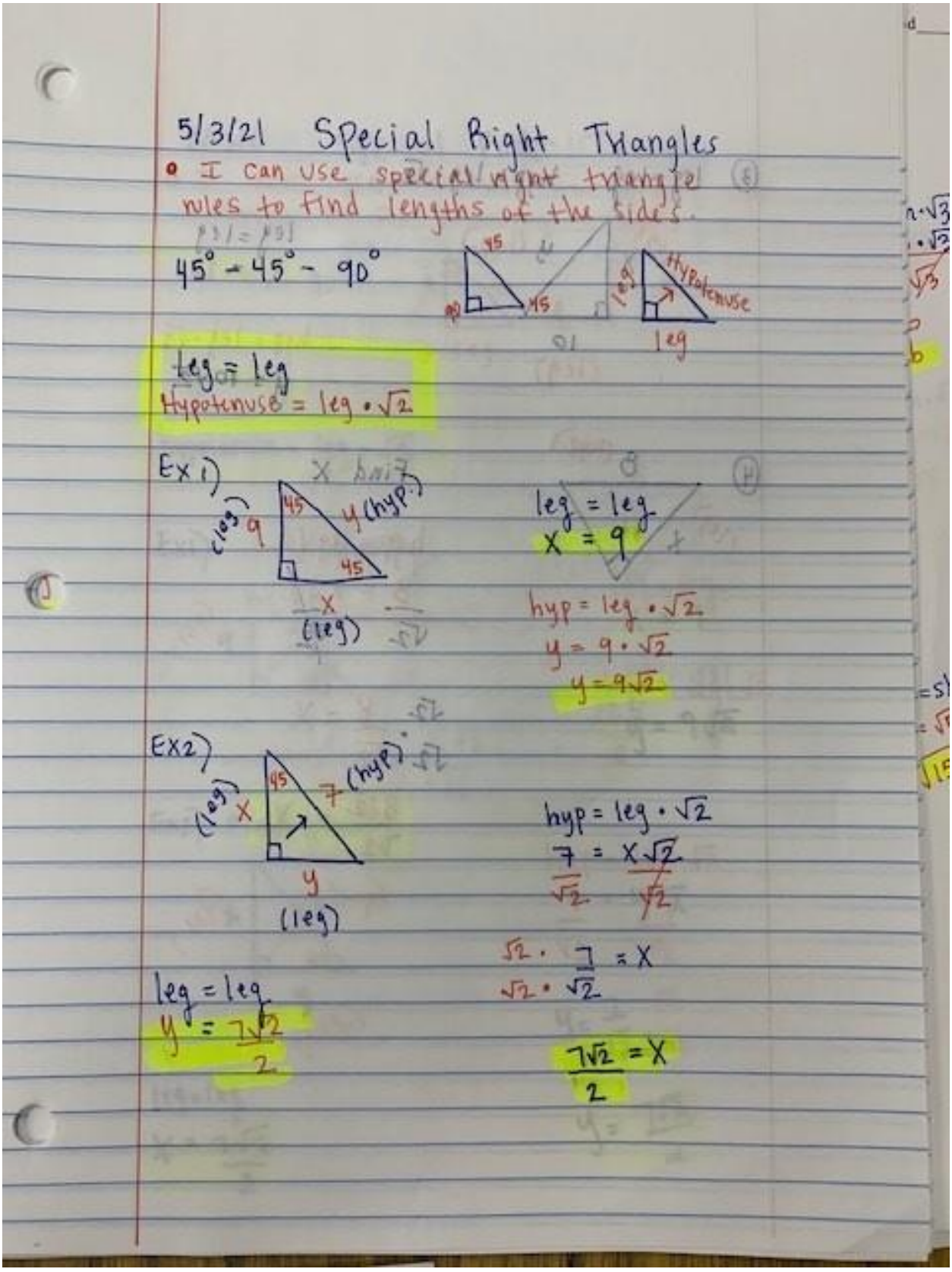
$a^2 + b^2 \_\_ c^2$

$14^2 + \sqrt{61}^2 \_\_ \sqrt{257}^2$

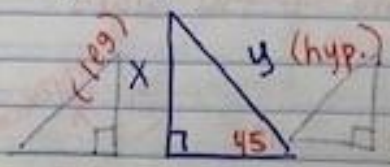
$196 + 61 \_\_ 257$

Right $257 = 257$

Lesson Four


5/3/21 Special Right Triangles
I can use special right triangle rules to find lengths of the sides.
45° - 45° - 90°
45
45
90
leg
leg
Hypotenuse
leg = leg
Hypotenuse = leg • √2
Ex 1)
9 (leg)
45
45
y (hyp.)
x (leg)
leg = leg
x = 9
hyp = leg • √2
y = 9 • √2
y = 9√2
Ex 2)
x (leg)
45
7 (hyp)
y (leg)
hyp = leg • √2
7 = x√2
√2 √2
√2 • 7/√2 • √2 = x
7√2/2 = x
leg = leg
y = 7√2/2

③ leg = leg hyp = leg · $\sqrt{2}$



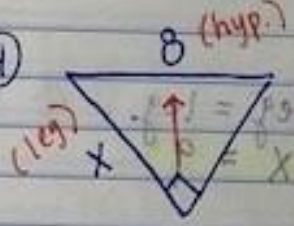
leg = leg

$x = 10$

hyp = leg · $\sqrt{2}$

$y = 10\sqrt{2}$

④



Find x

hyp = leg $\sqrt{2}$

$\frac{8}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}}$

$\sqrt{2} \cdot \frac{8}{\sqrt{2}} = x$

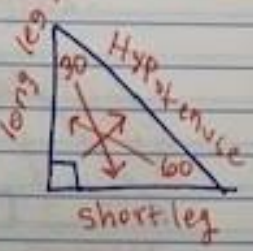
$\frac{8\sqrt{2}}{2} = x$

Lesson Five

05/04/21 Special Right Triangles Continued

- I can use special right △ rules to find missing lengths.

$30^\circ - 60^\circ - 90^\circ$

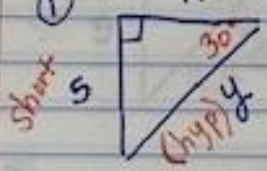


* Short leg : across from 30°.
* long leg : across from 60°.

Formulas:

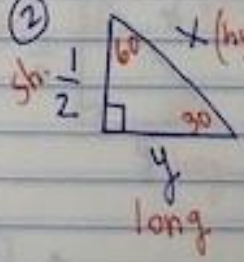
hyp = short leg • 2 Long leg = short leg • $\sqrt{3}$

Examples:

① 

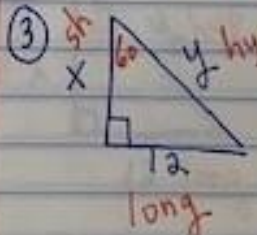
hyp = sh • 2
$y = 5 \cdot 2$
$y = 10$

long = sh • $\sqrt{3}$
$X = 5 \cdot \sqrt{3}$
$X = 5\sqrt{3}$

② 

hyp = sh • 2
$X = \frac{1}{2} \cdot 2$
$X = 1$

long = sh • $\sqrt{3}$
$y = \frac{1}{2} \cdot \sqrt{3}$
$y = \frac{\sqrt{3}}{2}$

③ 

hyp = Sh • 2
$y = 2x$
$y = \frac{12\sqrt{3}}{3} \cdot \frac{2}{1}$
$y = \frac{24\sqrt{3}}{3}$

long = sh$\sqrt{3}$
$\sqrt{3} \cdot \frac{12}{\sqrt{3}} = \frac{X\sqrt{3}}{\sqrt{3}}$
$\frac{12\sqrt{3}}{3} = X$