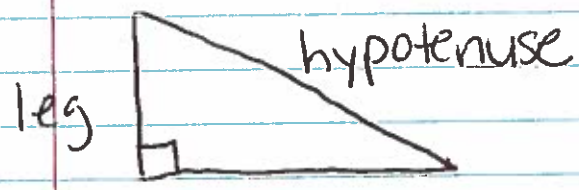
Day 53

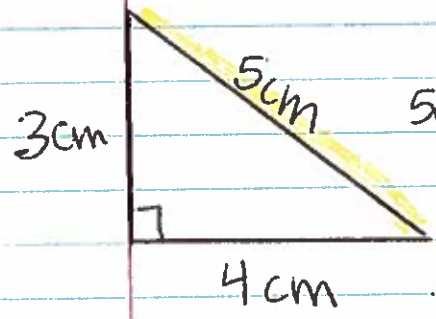
8.1 Pythagorean Theorem & its Converse

Pythagorean Theorem: $leg^2 + leg^2 = hyp^2$

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



* only works on right triangles

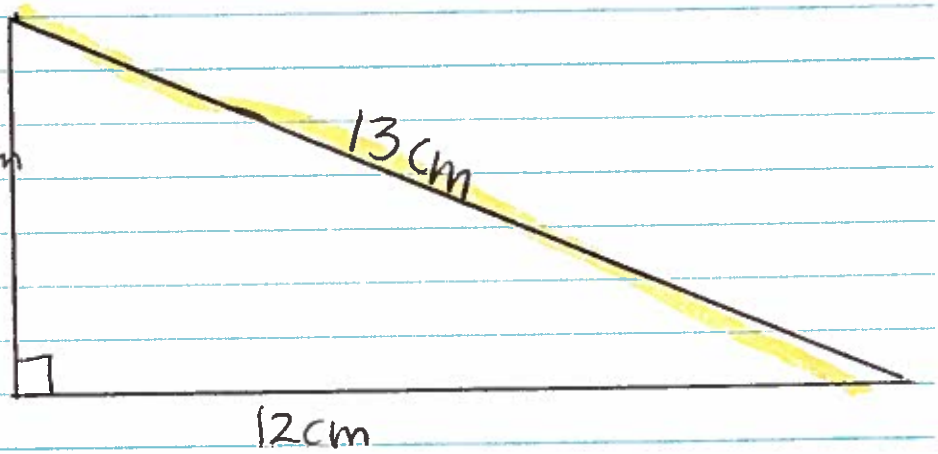


$3^2 + 4^2 = c^2$

$9 + 16 = c^2$

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

$5 = c$

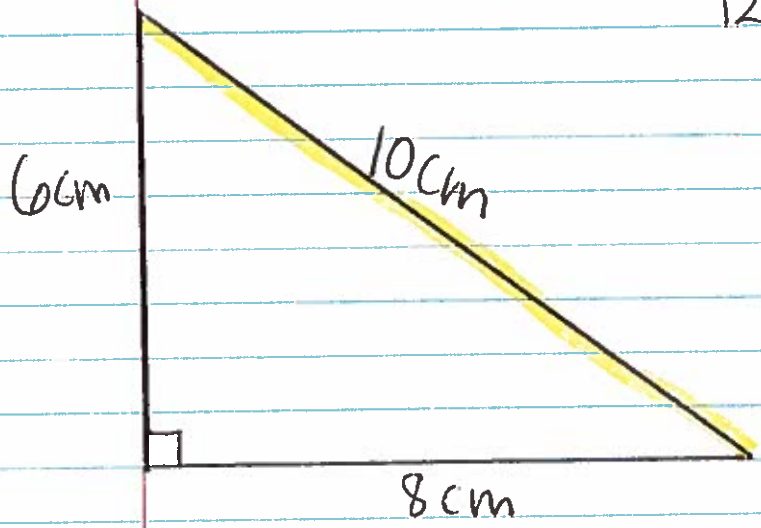


$5^2 + 12^2 = c^2$

$25 + 144 = c^2$

$\sqrt{169} = \sqrt{c^2}$

$13 = c$



$6^2 + 8^2 = c^2$

$36 + 64 = c^2$

$\sqrt{100} = \sqrt{c^2}$

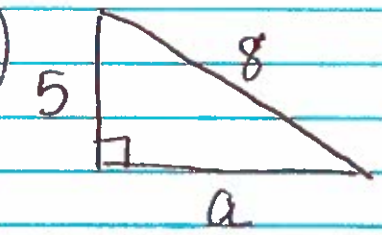
$10 = c$

Pythagorean Triples
(shortcuts, so you don't have to pyt. thm)

Leg, Leg, Hyp

	• 3, 4, 5	• 5, 12, 13	• 7, 24, 25
x2	• 6, 8, 10	• 10, 24, 26	• 14, 48, 50
x3	• 9, 12, 15	• 15, 36, 39	
x4	• 12, 16, 20		
x5	• 15, 20, 25		
x10	• 30, 40, 50		

ex



$leg^2 + leg^2 = hyp^2$

$5^2 + a^2 = 8^2$

$25 + a^2 = 64$

$-25 \quad -25$

$\sqrt{a^2} = \sqrt{39}$

$a = \sqrt{39} \approx 6.2$

ex leg = 1 hyp = 8

$1^2 + a^2 = 8^2$

$1 + a^2 = 64$

$-1 \quad -1$

$\sqrt{a^2} = \sqrt{63}$

$\sqrt{9} \cdot \sqrt{7}$

$a = 3\sqrt{7}$

ex Leg = 6 Leg = 9

$leg^2 + leg^2 = hyp^2$

$6^2 + 9^2 = c^2$

$36 + 81 = c^2$

$\sqrt{117} = \sqrt{c^2}$

$\sqrt{9} \cdot \sqrt{13}$

$3\sqrt{13} = c$

Converse of the Pythagorean Theorem:

If $a^2+b^2=c^2$ $\xrightarrow{\text{then}}$ the $\triangle$ is right

If $a^2+b^2 < c^2$ $\longrightarrow$ the $\triangle$ is obtuse

or $c^2 > a^2+b^2$

If $a^2+b^2 > c^2$, then the $\triangle$ is acute

or $c^2 < a^2+b^2$

* c is always the largest #

Packet

(2) $5, 7, \sqrt{85}$
$a \quad b \quad c$

$5^2+7^2 \stackrel{?}{=} (\sqrt{85})^2$

$74 < 85$

obtuse

(a) $2, \sqrt{5}, 3$
$a \quad b \quad c$

right

$2^2+(\sqrt{5})^2 \stackrel{?}{=} 3^2$

$4+5 \stackrel{?}{=} 9$

$9 = 9$

(ex) $3, 2\sqrt{5}, 4$
$a \quad c \quad b$

$3^2+4^2 \stackrel{?}{=} (2\sqrt{5})^2$

$9+16$

$25 > 20$

Acute

Chapter 8 Name _____ BLOCK ____

8.1 Pythagorean Theorem

Find the missing lengths.

	Leg	Leg	Hypotenuse
1.	24	10	
3.	5	$\sqrt{39} = 6.2$	8
5.	6	9	$3\sqrt{13}$
7.	$3\sqrt{7}$	$\frac{7}{7}$	$\frac{32}{4}$
9.	8	10	

$(\sqrt{7})^2 + 3^2 ? 4^2$

$7 + 9 = 16$

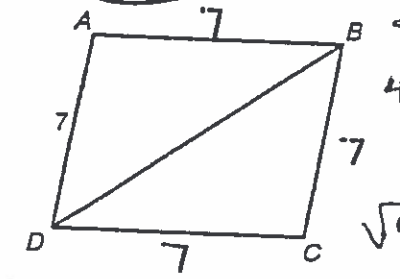
8.1 Converse of Pythagorean Theorem.

Acute, Obtuse, or Right

2. 5, 7, $\sqrt{85}$ obtuse
4. 12, 12, 12 (equilateral) acute
6. a b c 2, $\sqrt{5}$, 3 right
8. 4, 6, 7 _____
10. $\sqrt{7}$, 3, 4 $16 = 16$ right
12. $\sqrt{5}$, 3, 7 _____

14. For what value of *DB* will rhombus *ABCD* be a square?

$7\sqrt{2}$



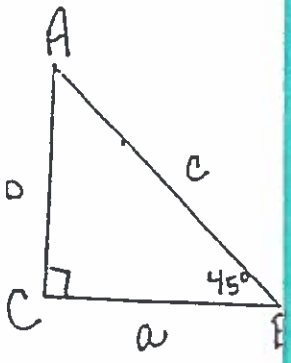
$7^2 + 7^2 = c^2$

$49 + 49 = c^2$

$\sqrt{98} = \sqrt{c^2}$

$\sqrt{49} \cdot \sqrt{2} = 7\sqrt{2}$

8.2 Special Right Triangles



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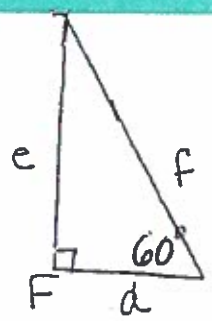
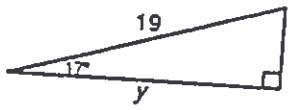
(2, 4, 6-10 all, 12, 14, 16-25 all)

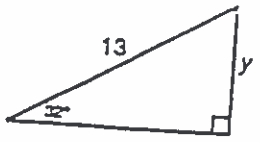
	d	e	f
8.	$8\sqrt{3}$		
10.		$7\sqrt{3}$	
12.			32



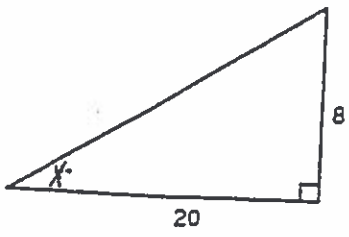
Trig Ratios 8.3 + 8.4

1. 

$y =$

2. 

$y =$

3. 

$x =$

1