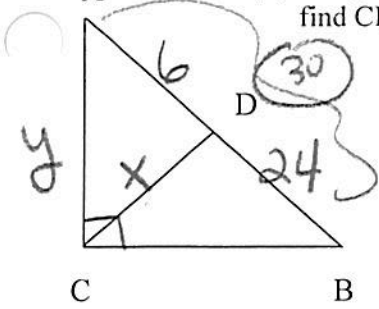


# Homework #2

- (1) In right triangle ABC, altitude CD is drawn on hypotenuse AB. If AD = 6 and DB = 24, find CD and AC.



SAAS

$$\frac{6}{x} = \frac{x}{24}$$

$$x^2 = 144$$

$$x = 12$$

HLLS

$$\frac{30}{y} = \frac{y}{6}$$

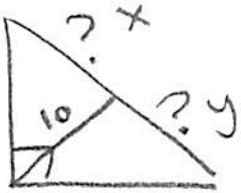
$$y^2 = 180$$

$$y = \sqrt{180}$$

- (2) If the altitude drawn to the hypotenuse of a right triangle has length 10, the lengths of the segments of the hypotenuse may be:

- (1) 2 and 5      (2) 3 and 7      (3) 50 and 50      (4) 5 and 20

SAAS



$$\frac{x}{10} = \frac{10}{y}$$

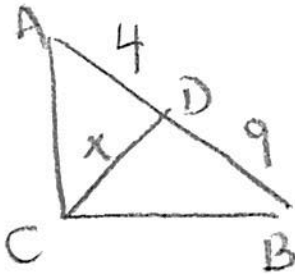
$$xy = 100$$

$x \cdot y$  must equal 100

so which choice ????

- (3) In right triangle ABC, altitude CD is drawn to the hypotenuse AB. If AD = 4 and DB = 9, find CD.

SAAS



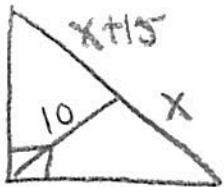
$$\frac{4}{x} = \frac{x}{9}$$

$$x^2 = 36$$

$$x = 6$$

- (4) The altitude to the hypotenuse of a right triangle divides the hypotenuse into two segments. The length of one segment exceeds the length of the other segment by 15. If the length of the altitude is 10, find the length of the shorter segment.

SAAS



$$\frac{x+15}{10} = \frac{10}{x}$$

$$100 = x(x+15)$$

$$100 = x^2 + 15x$$

$$0 = x^2 + 15x - 100$$

$$0 = (x+20)(x-5)$$

$x+20=0$	$x-5=0$
$x=-20$	$x=5$

Shorter seg = 5

- (5) An equilateral triangle has a perimeter of 30 inches. What is the length of the altitude of the triangle to the nearest tenth?

Pythag Thm



$P = 30$       10

$$x^2 + 5^2 = 10^2$$

$$x^2 + 25 = 100$$

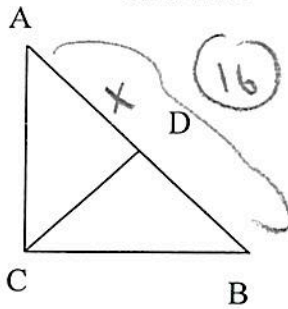
$$x^2 = 75$$

$$x = \sqrt{75} = 8.7$$

(6) In right triangle ABC, CD is the altitude drawn to the hypotenuse AB. AC is 4 more than AD. If AB = 16, find the length of AC.

HLLS

$x+4$



$$\frac{16}{x+4} = \frac{x+4}{x}$$

$$16x = (x+4)(x+4)$$

$$16x = x^2 + 4x + 4x + 16$$

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

$$0 = x^2 - 8x + 16$$

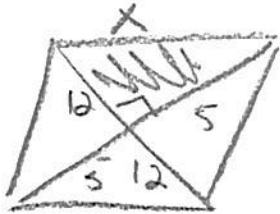
$$0 = (x-4)(x-4)$$

$x-4=0$	$x-4=0$
$x=4$	$x=4$

**AC = 4+4 = 8**

(7) If the lengths of the diagonals of a rhombus are 24 and 10, what is the length of a side of the rhombus?

Pythag  
Thm



$$12^2 + 5^2 = x^2$$

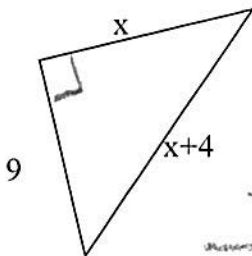
$$144 + 25 = x^2$$

$$169 = x^2$$

**13 = x**

(8) Find the value of x in the diagram below:

Pythag  
Thm



$$x^2 + 9^2 = (x+4)^2$$

$$x^2 + 81 = (x+4)(x+4)$$

$$x^2 + 81 = x^2 + 4x + 4x + 16$$

$$-x^2 \quad -x^2$$


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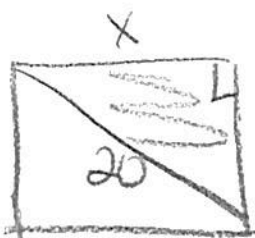

$$81 = 8x + 16$$

$$-16 \quad -16$$

**x = 8.125**

(9) The length of the diagonal of a square is 20. Find the length of the side of the square in simplest radical form.

Pythag  
Thm



$$x^2 + x^2 = 20^2$$

$$2x^2 = 400$$

$$\frac{2x^2}{2} = \frac{400}{2}$$

$$\sqrt{x^2} = \sqrt{200}$$

$$x = \sqrt{200}$$

$$x = \sqrt{100 \cdot 2}$$

**x = 10√2**

(10) Could the lengths given represent the lengths of the sides of a right triangle?

Pythag  
Thm

Sum of  
smallest  
sides

(a) {7,8,9}

✓  $7+8 > 9$

third

NOT A

$7^2 + 8^2 = 9^2$

$49 + 64 = 81$

$113 = 81$  No!

(b) {2,5,7}

✓  $2+5 > 7$

NO NOT

A triangle

(c) {6,8,10}

✓  $6+8 > 10$

$6^2 + 8^2 = 10^2$

$36 + 64 = 100$

$100 = 100$  ✓