BE - Geometry 11 — Wednesday 11-2-11

FACTOR

① $4c^2 - 9$

② $9x^2 - 24x + 16$

③ $x^2 + 4xy + 4y^2$

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④ Find the equation of the line perpendicular to the line $y = -2$ that passes through the point $(4, 3)$

ANS

① DOS $(2c-3)(2c+3)$

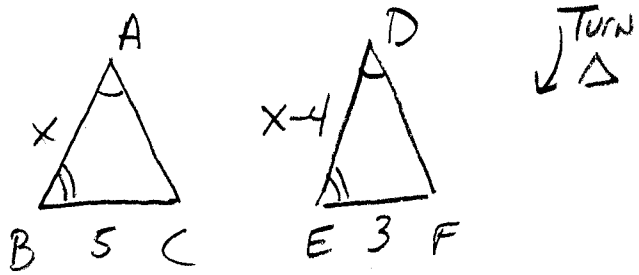
② PST $(3x-4)^2$

③ PST $(x+2y)^2$

④ $x = 4$

Homework Review Pg 301, 5-8 Pg 345, 4-7

(5) Find x, $\overline{AB}$, $\overline{DE}$



$\triangle ABC \sim \triangle DEF$

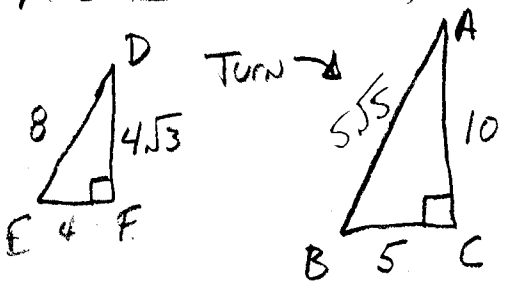
$\frac{5}{3} = \frac{x}{x-4}$ $\therefore$ $5x - 20 = 3x$

$2x = 20$

$x = 10$ $\therefore$ $\overline{AB} = 10$, $\overline{DE} = 6$

Are $\triangle$'s Similar, Justify

(6)



$\frac{EF}{BC} \stackrel{?}{=} \frac{ED}{BA}$

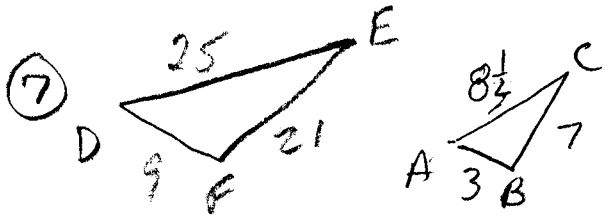
$\frac{4}{5} = \frac{8}{5\sqrt{5}}$

$DF^2 = 8^2 - 4^2$
$= 64 - 16 = 48$
$DF = \sqrt{48} = 4\sqrt{3}$

$AB^2 = 10^2 + 5^2$
$= 125$
$AB = 5\sqrt{5}$

Since sides are not in proportion, $\triangle$'s are not similar

(7)



Are SSS in proportion?

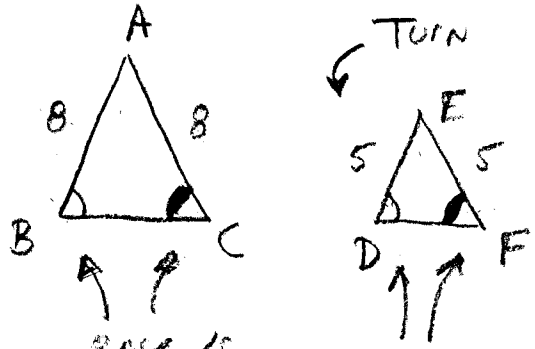
$\frac{25}{8\frac{1}{3}} \stackrel{?}{=} \frac{21}{7} = \frac{9}{3}$?

$\frac{25}{\frac{25}{3}} \stackrel{?}{=} \frac{3}{1} \stackrel{?}{=} \frac{3}{1}$

$\frac{75}{25} = \frac{3}{1} = \frac{3}{1}$ ✓

$\triangle DEF \sim \triangle ACB$

⑧



BASE ∠s OF ISOSCELES △ ≅

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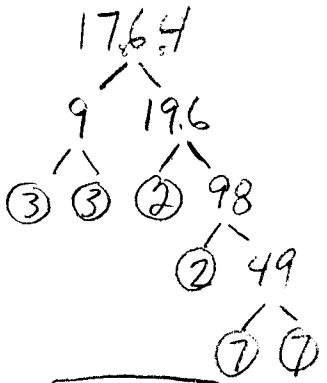
∴ $\triangle ABC \sim \triangle EDF$ BY AA SIMILARITY

FIND THE GEOMETRIC MEANS: (Pg 345)

④ 9, 4 ⇒ $\frac{9}{x} = \frac{x}{4}$ $x^2 = 36$ $\boxed{x = 6}$

⑤ 36, 49 ⇒ $\frac{36}{x} = \frac{x}{49}$

$$\begin{array}{r} 36 \\ \times\ 49 \\ \hline 324 \\ 144 \\ \hline 1764 \end{array}$$



$x^2 = 1764$

$x = \sqrt{1764}$

$\boxed{x = 42}$

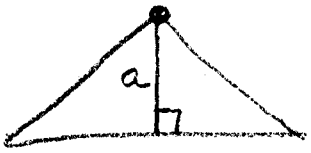
$\sqrt{1764} = \sqrt{3^2 2^2 7^2} = 3 \cdot 2 \cdot 7 = 42$

⑥ 6, 8 $\frac{6}{x} = \frac{x}{8}$ $x^2 = 48$ $x = \sqrt{48} = \boxed{4\sqrt{3} = x}$ ($\sqrt{48}$: 16, 3)

⑦ $2\sqrt{2}$, $3\sqrt{2}$ $\frac{2\sqrt{2}}{x} = \frac{x}{3\sqrt{2}}$ $6 \cdot 2 = x^2$ $x^2 = 12$ $x = \sqrt{12}$ $\boxed{x = 2\sqrt{3}}$

DEFINITION

Altitude (of a △) A line segment from a vertex perpendicular to the opposite side (or the extension of the opposite side if necessary)

Ex 

Ex 

Ex 

NOTE

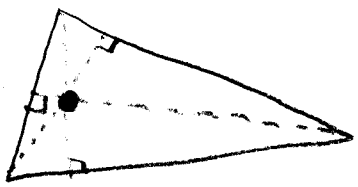
Every △ has 3 altitudes

height the length (measure) of an altitude

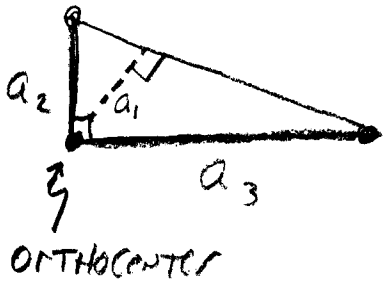
area of △ $A = \frac{1}{2} b h$

↑ altitude from base b

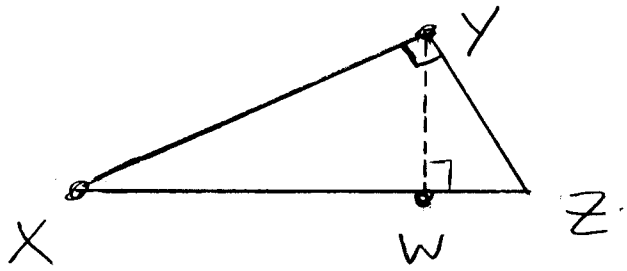
The 3 altitudes of a △ meet in a point called the orthocenter. It may be inside or outside of △



In a right $\triangle$, 2 of the 3 altitudes are the legs



Theorem 7-1 (Pg 343) The altitude to the hypotenuse of a right $\triangle$ forms 2 $\triangle$'s similar to the original $\triangle$



$\triangle XYZ$ = ORIGINAL $\triangle$

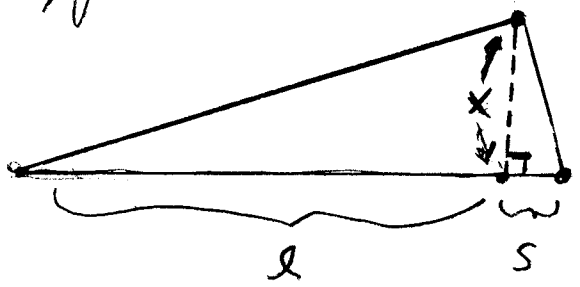
YW = ALTITUDE OF $\triangle XYZ$

$\triangle XYW \sim \triangle ZYW \sim \triangle XYZ$

(ORIGINAL $\triangle$)

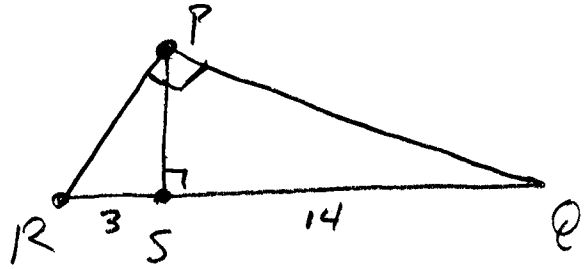
Theorem 7.2 (Pg 343)

The height (measure) of the altitude to the hypotenuse of a Right △ is the geometric mean of the measures of the two segments of the hypotenuse.



$$\frac{\ell}{x} = \frac{x}{s} \quad \text{or} \quad x = \sqrt{\ell s}$$

Ex 2 (Pg 344) FIND PS



IF $RS = 3$ AND $QS = 14$

$$\frac{3}{PS} = \frac{PS}{14} \quad \therefore PS^2 = 42$$

$$\boxed{PS = \sqrt{42}} \qquad PS \approx 6.5$$

Homework: Pg 345 # 8, 9
Pg 346 # 21, to 26