Name **Key**   Date _____ Pd ____

6.1 – 6.3 Day TWO CYU: Median, Altitude, Angle Bisector, & Perpendicular Bisector

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Identifying special segments	1 – 4		
Drawing special segments	5		
Solving triangles with special segments		6 - 16	16

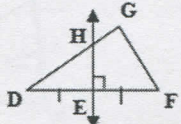**1 – 4: Name the special segment.**

1) $\overline{AC}$

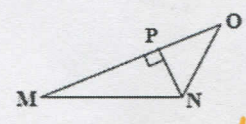2) $\overline{HE}$

3) $\overline{JL}$
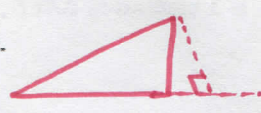
4) $\overline{PN}$
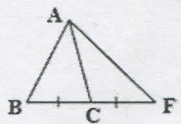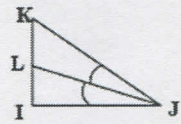
median   ⊥ bisector   ∠ bisector   altitude
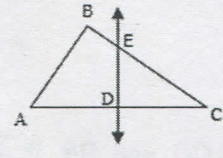
5) Draw a triangle with an altitude outside the triangle.

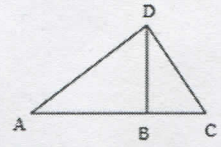**6 – 9: Solve the triangle for the variables or parts of the triangles.**

6) In $\triangle ABC$, $\overline{DE}$ is perpendicular bisector of $\overline{AC}$ with D on $\overline{AC}$. If $AD = 2y + 4$, $CD = y + 12$, and $m\angle EDC = 5(x - 12)°$. Find the value of x and y. Find length of AD, DC, and, AC.

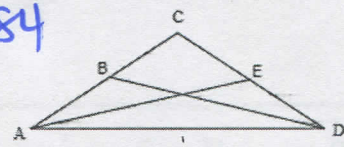$AD = 20, DC = 20, AC = 40$

$X = 30$

$y = 8$

7) $\overline{DB}$ is an altitude of $\triangle ADC$, and $m\angle DBC = (n^2 + 81)°$. Find the value of n.
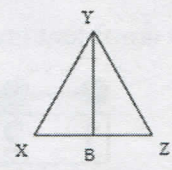
$n = \pm 3$

8) $\overline{DB}$ and $\overline{AE}$ are medians. If $BC = 6y + 10$, $AB = y^2 + 3y$, $CE = 6x + 12$, $ED = 2x + 60$, then find the value of x and y, and the length of the segments.

$X = 12$ $AB = 40$ $ED = 84$

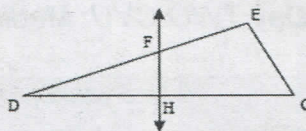$y = 5$ $BC = 40$

$CE = 84$

9) $\overline{YB}$ is an altitude of $\triangle XYZ$, and $m\angle YBZ = (6x - 6)°$. Find the value of x. What is the measure of $\angle YBZ$?
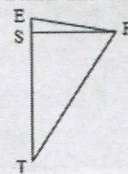
$X = 16$

$m\angle YBZ = 90°$

10) In $\triangle DEG$ $\overrightarrow{FH}$ is a perpendicular bisector of $\overline{DG}$ with H on $\overline{DG}$. If $DH = 2y + 3$, $GH = 7y - 42$, and $m\angle FHG = (x^2 + 9)°$, then find the value of x and y. What is the measure of DG?
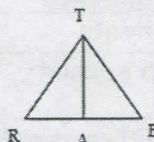
$x = \pm 9$
$y = 9$
$DG = 42$

11) $\overline{RS}$ is an altitude of $\triangle RTE$, $m\angle SRT = (4x - 8)°$, and $m\angle STR = (6x + 13)°$. Find the value of x.
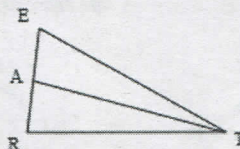
$x = 8.5$

12) In $\triangle RTE$, $\overline{TA}$ bisects $\angle RTE$, $m\angle RTA = (3y - 4)°$, and $m\angle ETA = (4y - 17)°$. Find the measure of $\angle RTE$.
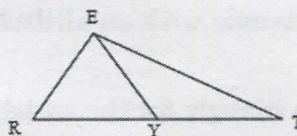
$m\angle RTE = 70°$

13) $\overline{TA}$ is a median of $\triangle RTE$, $AE = 3x - 11$, and $AR = x + 5$. Find $AE, AR,$ and, ER.
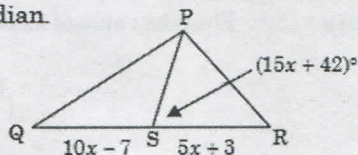
$AE = 13$
$AR = 13$
$ER = 26$

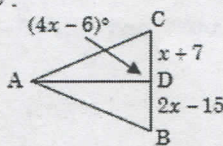14) $\overline{EY}$ is a median of $\triangle RET$, $RY = 2z - 1$, and $TY = 4z - 11$. Find $\overline{RT}$.

$RT = 18$

15) Find x and the measure of $\angle PSR$, if $\overline{PS}$ is a median.
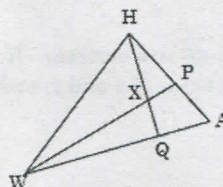
$x = 2$
$m\angle PSR = 72°$

$(15x + 42)°$
$10x - 7$ $5x + 3$

16) Find x, CD, and DB, if $\overline{AD}$ is an altitude of $\triangle ABC$.

$x = 24$
$CD = 31$
$DB = 33$

$(4x - 6)°$
$x + 7$
$2x - 15$

17) $\triangle WHA$, if $\overline{WP}$ is a median and an angle bisector, $AP = 3y + 11$, $PH = 7y - 5$, $m\angle HWP = x + 12$, $m\angle PAW = 3x - 2$, and $m\angle HWA = 4x - 16$, find x and y. Is $\overline{WP}$ also an altitude, explain?

$x = 20$
$y = 4$
yes. $m\angle XPH = 90°$