Name___**Key**___ Date _____ Pd ___

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

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Drawing & Labeling special segments	1 - 4	5	
Counterexamples		6 - 8	
Solving Triangles with Special Segments	9		20 - 22
Properties of Special Segments	16 – 19, 24 - 26	10 - 15	27
Graphing Coordinates	23		
Midpoint Formula	24		
Perpendicular Slope	25, 26		
Slope	25, 26		
Distance Formula	27		

1 – 5: Draw and label a figure to illustrate each situation. Be sure to include appropriate markings.
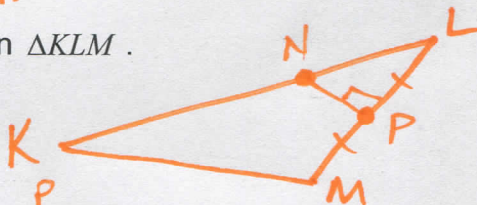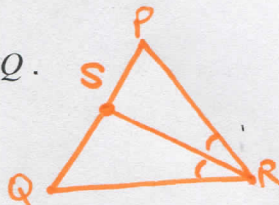
1. $\overline{AD}$ is an altitude of $\triangle ABC$.
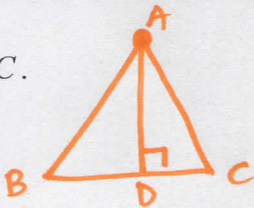
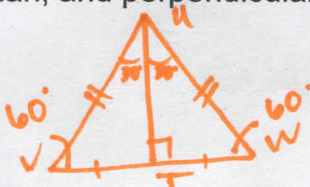2. $\overline{GH}$ is a median of $\triangle EFG$.
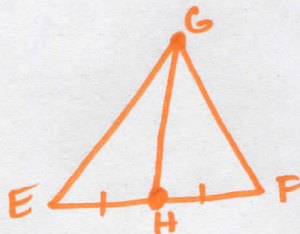
3. $\overline{NP}$ is a perpendicular bisector of $\overline{ML}$ in $\triangle KLM$.

4. $\overline{RS}$ is the angle bisector of $\triangle PRQ$.

5. $\overline{TU}$ is the altitude, median, and perpendicular bisector of $\triangle UVW$.

6 – 8: Answer the following with Always, Sometimes or Never. Give Counterexamples.

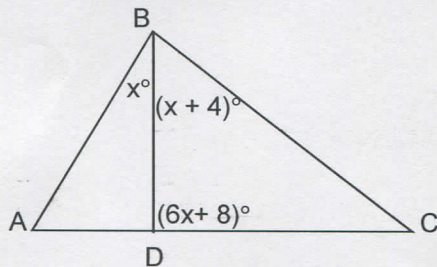S 6. The three altitudes of a triangle intersect at a vertex of the triangle.

N 7. The three medians of a triangle intersect at a point outside the triangle.

A 8. The three angle bisectors of a triangle intersect at a point inside the triangle

9. Find the value of x if $\overline{BD}$ is an altitude of △ABC. $x \approx 13.667$

B

$x°$ $(x + 4)°$

A $(6x+ 8)°$ C
    D

10 – 15: Use the picture in the corner to determine if the statements are True or False: (write out the whole word.)

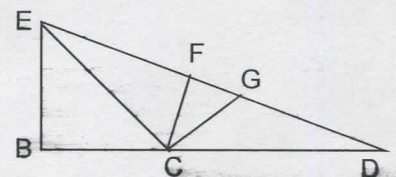False 10. If G is the midpoint of $\overline{ED}$, then $\overline{CG}$ is a median of △EBD.

True 11. If $\overline{CF} \perp \overline{ED}$, then $\overline{CF}$ is an altitude of both △ECD and △ECG.

True 12 If $\overline{EB} \perp \overline{BD}$, the $\overline{EB}$ is an altitude of △ECD.

False 13. If $\overline{CF} \perp \overline{ED}$, then $\overline{CF}$ is a perpendicular bisector of △ECD.

True 14. If $\overline{CG}$ is a median of △ECD, then G is the midpoint of $\overline{ED}$.

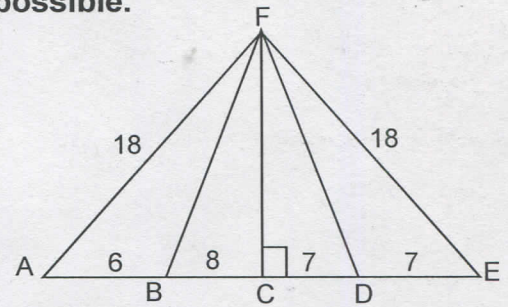True 15. Each leg of a right triangle is also an altitude of the triangle.

E
   F
     G

B
   C   D

16 – 19: Complete each statement in as many ways as possible.

16. FD is ___median___ of △FCE. (1 answer)

17. FC is ___median, altitude, ⊥ bisector, ∡ bisector___ of △AFE. (4 answers)

18. FC is ___altitude___ of △BFE. (1 answer)

19. FC is an altitude of ___10___ triangles.

Figure: Triangle with apex F. Sides marked 18 (left, from A to F) and 18 (right, from E to F). Base from A to E with points B, C, D. Base segments marked: A–B = 6, B–C = 8, C (right angle marked) with C–D = 7, D–E = 7.

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20. Find $\overline{AB}$ if $\overline{BD}$ is a median of △ABC.

Triangle with vertex B at top, A bottom left, C bottom right, D on base AC. Side AB = $x-7$. Base segments: A–D = $x+3$, D–C = $2x-17$.
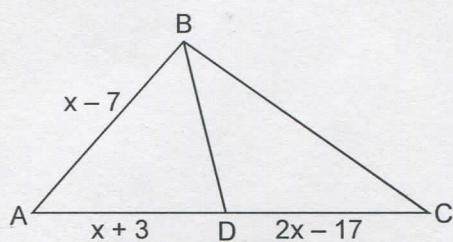
AB = 13u

21. Find $\overline{BC}$ if $\overline{AD}$ is an altitude of △ABC.

Triangle with vertex A at top, B bottom left, C bottom right, D on base BC. Angle at B area: $(4x+10)°$. Base segments: B–D = $3x-4$, D–C = $2x$.
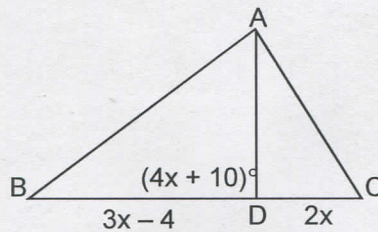
BC = 96

22. Find m∠ABC if $\overline{BD}$ is an angle bisector of △ABC.

Triangle with vertex B top, A bottom left, C bottom right, D on base AC. m∠ABC = $(4x-6)°$. Angle $(x+6)°$.
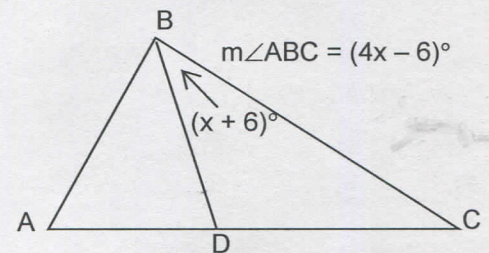
m∠ABC = 30°

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23. Plot the points. A(2, 5), B(12, -1), and C(-6, -8) are the vertices of Δ ABC.
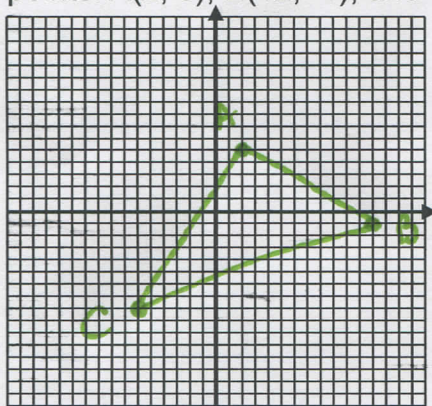
24. What are the coordinates of K if $\overline{CK}$ is a median of △ABC?

K(7, 2)

25. What is the slope of the perpendicular bisector of $\overline{AB}$?

$$m = \frac{5}{3}$$

26. What is the slope of $\overline{CL}$ if $\overline{CL}$ is the altitude from point C?

$$m = \frac{5}{3}$$

27. Point N on $\overline{BC}$ has coordinates $\left(6, \frac{-10}{3}\right)$. Is $\overline{NA}$ an altitude of $\triangle ABC$? Explain your answer.
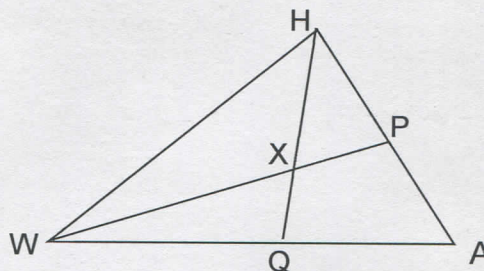
NO   m not ⊥

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In $\triangle AHW$, m∠A = 64° and m∠AWH = 36°. If $\overline{WP}$ is an angle bisector and $\overline{HQ}$ is an altitude, find each measure.

28. m∠AQH = __90°__

29. m∠APW = __98°__

30. m∠AHQ = __26°__

31. m∠HXW = __108°__

32. If $\overline{WP}$ is a median, AP = 3y + 11 and PH = 7y – 5, find AH.

AH = 46

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