BERNHARD – GT Geometry

Chapter 6 Section 3 - Homework

Name _____

Date Due _____

Period _____

Medians and Altitudes of Triangles

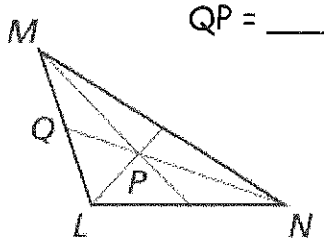
1. Name the four types of **Points of Concurrency**. Which lines intersect to form each of the points?

Point of Concurrency	Special Segment
1.	
2.	
3.	
4.	

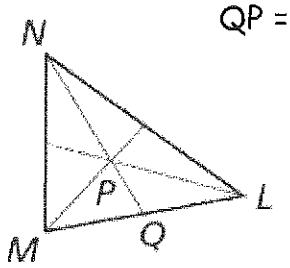
2. The length of a segment from a vertex to the **Centroid** is _____ the length of the median from that vertex

For #3 – 6, point P is the **Centroid** of ΔLMN.

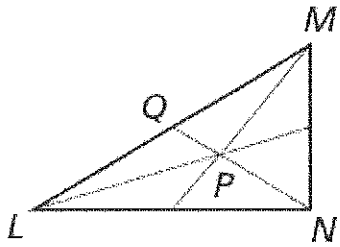
3. QN = 9 PN = _____
QP = _____



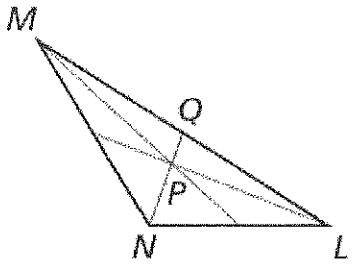
4. QN = ____ PN = $4x+8$
QP = $3x$



5. QN = $12\sqrt{6}$ PN = _____
QP = _____



6. QN = ____ PN = _____
QP = $4+\sqrt{3}$



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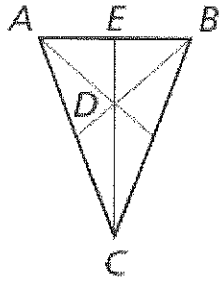
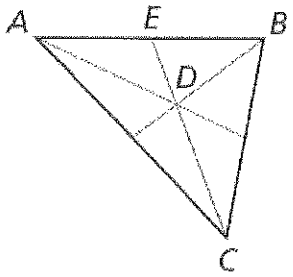
For #7 – 10, point D is the **Centroid** of ΔABC.

7. DE = 5 CD = _____
CE = _____

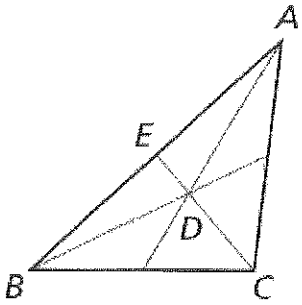


8. DE = 11 CD = x^2
CE = _____

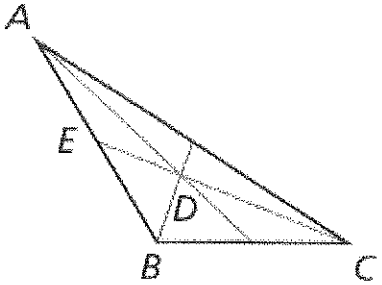


X = _____

9. DE = $9\sqrt{5}$ CD = _____
CE = _____

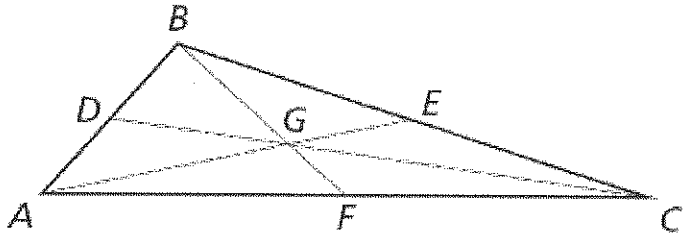


10. DE = 15x CD = $19x + 220$
CE = _____



For #11 – 14, point G is the **Centroid** of ΔABC. BG = 6, AF = 12, DC = 15, EG = 4, and BE = 8. Find the length of each segment. Label the triangle. Show all work.

11. AC =



12. BF =

13. AG =

14. DG =

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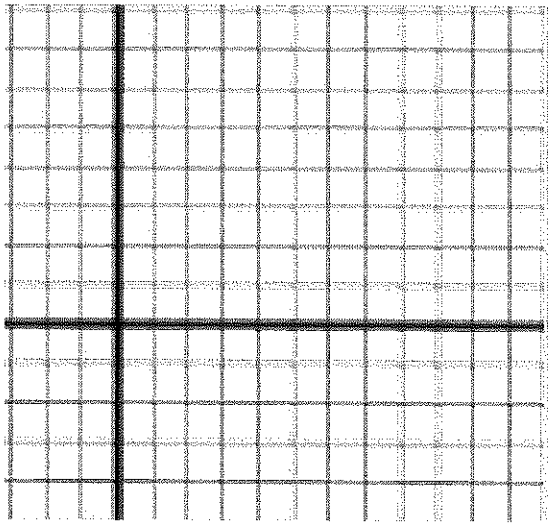
15. Find the coordinates of the **Centroid** of the triangle with the given vertices

S(5, 5) T(11, -3) U(-1, 1)



Midpoint$_{ST}$: _____

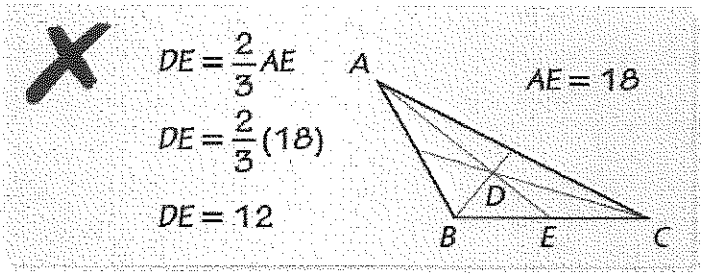
Midpoint$_{TU}$: _____

Midpoint$_{SU}$: _____

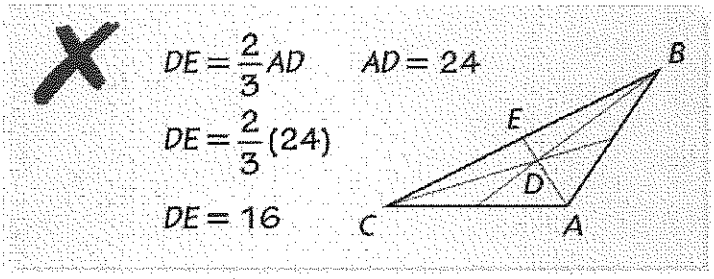
Coordinates of the Centroid: _____

For #16 - 17, describe and correct the error in finding DE. Point D is the **Centroid** of ΔABC

16.



17.



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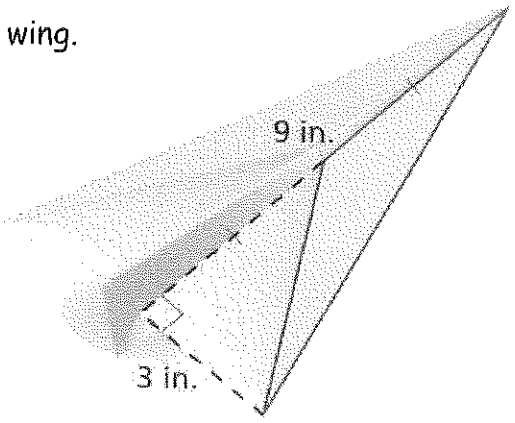
18. Find the area of the triangular part of the paper airplane wing.

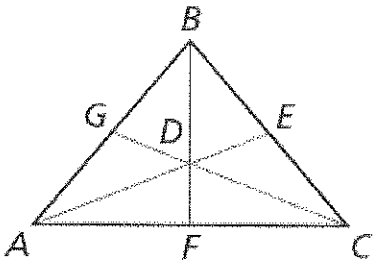


Area = _____

Which special segment of the triangle did you use?

For #19 – 22, point D is the **Centroid** of ΔABC. Use the given information to find the value of x.

19. BD = 4x + 5 BF = 9x x = _____



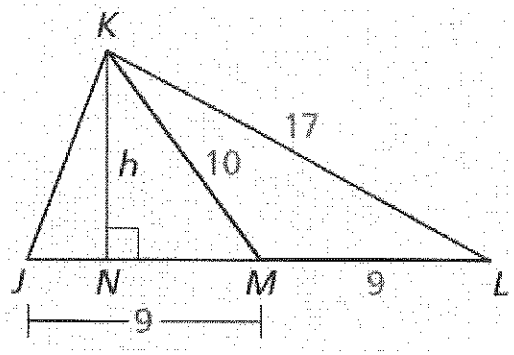
20. GD = 2x – 8 GC = 3x + 3 x = _____

21. AD = 5x DE = 3x – 2 x = _____

22. DF = 4x – 1 BD = 6x + 4 x = _____

23. In what type of triangles can a vertex be one of the points of concurrency of the triangle? Explain your reasoning.

For #24 - 28, use the figure.



24. What type of segment is $\overline{KM}$?

25. Which point of concurrency lies on $\overline{KM}$?

26. What type of segment is $\overline{KN}$?

27. Which point of concurrency lies on $\overline{KN}$?

28. Compare the areas of ΔJKM and ΔKLM.

Area of ΔJKM = _____

Area of ΔKLM = _____

Do you think the areas of the triangles formed by the median of any triangle will always compare this way? Explain your reasoning.

29. Your friend claims that it is possible for the **Circumcenter**, **Incenter**, **Centroid**, and **Orthocenter** to all be the same point. Do you agree? Explain your reasoning.

For #30 - 35, complete the statement with *always*, *sometimes*, or *never*. Explain your reasoning.

30. The **Centroid** is _____ on the triangle.

31. The **Orthocenter** is _____ outside the triangle.

32. A **Median** is _____ the same line segment as a perpendicular bisector.

33. An **Altitude** is _____ the same line segment as an angle bisector.

34. The **Centroid** and **Orthocenter** are _____ the same point.

35. The **Centroid** is _____ formed by the intersection of the three medians.