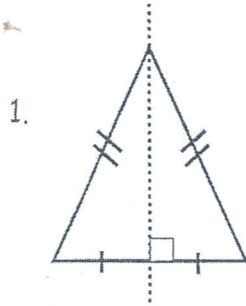


TRIANGLES REVIEW #2

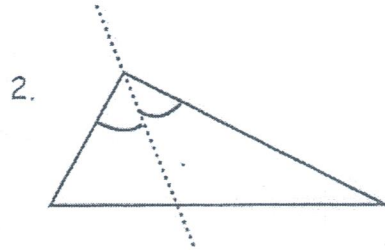
Name KEY!

Given the following pictures and markings, identify if the dotted line is (a) an angle bisector, (b) a perpendicular bisector, (c) an altitude, or (d) a median. List all that apply.

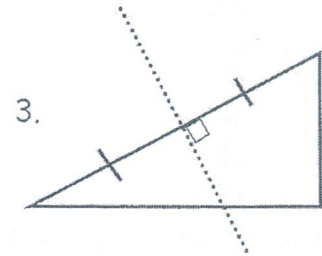
1. B



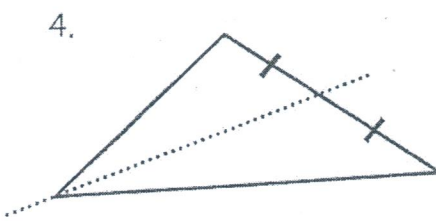
2. A



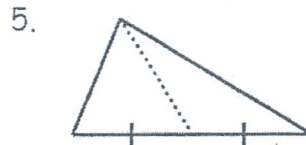
3. D



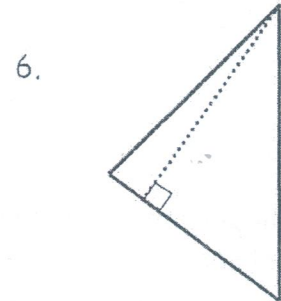
4. D



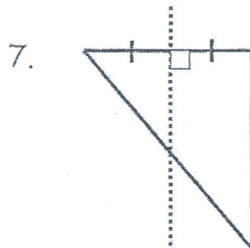
5. D



6. C



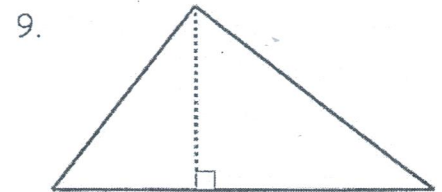
7. C



8. B



9. C



10. Graph $\triangle CAR$ using the points $C(-4, 0)$, $A(2, -4)$, and $R(3, 4)$. Then, answer the questions.

a) Find the midpoint of \overline{CA} . $(-1, 2)$ $\left(\frac{-4+2}{2}, \frac{0-4}{2}\right) = (-1, 2)$

b) Label this point S on the graph.

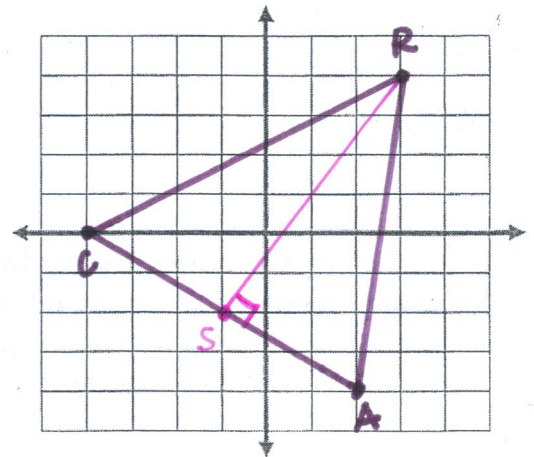
c) Connect point S to R .

d) Find the slope of \overline{CA} $-\frac{2}{3}$ $m = \frac{-4-0}{2-(-4)} = \frac{-4}{6} = -\frac{2}{3}$

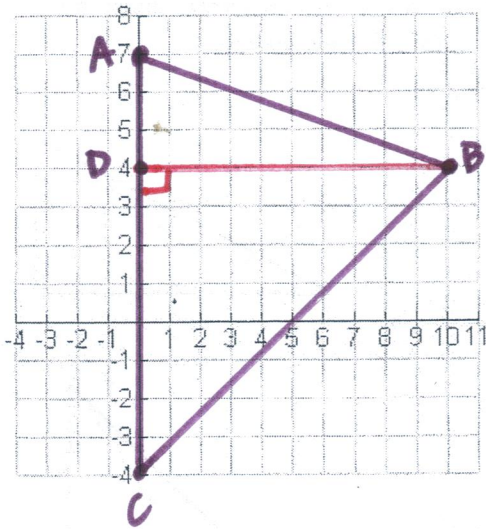
e) Find the slope of \overline{RS} $\frac{3}{2}$ $m = \frac{4+2}{3-(-1)} = \frac{6}{4} = \frac{3}{2}$

f) \overline{CA} and \overline{RS} are perpendicular lines.

g) Therefore, \overline{RS} is a/an altitude, median, and perp. bisector.

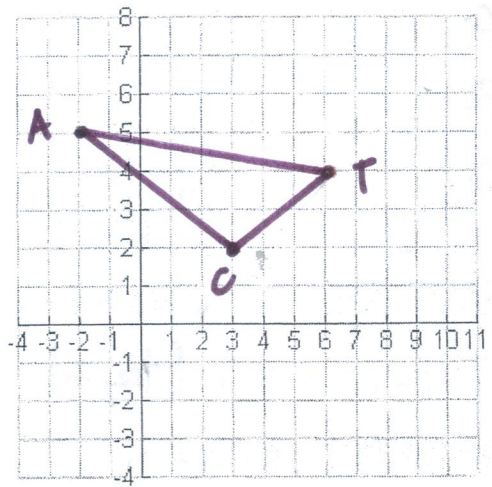


11. The vertices of a triangle have coordinates $A(0, 7)$, $B(10, 4)$, and $C(0, -4)$. What is the best name for the line segment that contains the points $B(10, 4)$ and $D(0, 4)$?

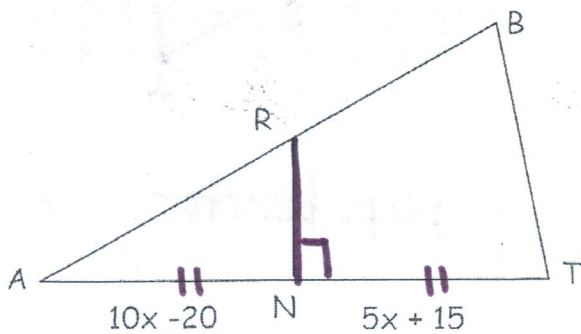


- A. Median
- B. Perpendicular Bisector
- C. Altitude**
- D. Angle Bisector

12. Recall perpendicular lines have negative reciprocal slopes. Graph the following points: $C(3, 2)$, $A(-2, 5)$, and $T(6, 4)$ and find the altitude from T to the line CA . The altitude is a line from a vertex which is perpendicular to the side across from the vertex.



13. RN is the perpendicular bisector of AT . How would you find the value of x ? What are the lengths of AN and NT ?



Set $AN = NT$

$$\begin{array}{r} 10x - 20 = 5x + 16 \\ -5x \quad -5x \\ \hline \end{array}$$

$$\begin{array}{r} 5x - 20 = 16 \\ +20 \quad +20 \\ \hline \end{array}$$

$$\frac{5x}{5} = \frac{36}{5}$$

$$\boxed{x = 7}$$

$$AN = 10(7) - 20 = 70 - 20$$

$$\boxed{AN = 50}$$

$$\therefore NT = 50$$

Name _____ Date _____ Class Period _____

Point of Concurrency Worksheet

Give the name the point of concurrency for each of the following.

1. Angle Bisectors of a Triangle incenter
2. Medians of a Triangle centroid
3. Altitudes of a Triangle orthocenter
4. Perpendicular Bisectors of a Triangle circumcenter

Complete each of the following statements.

5. The *incenter* of a triangle is equidistant from the sides of the triangle.
6. The *circumcenter* of a triangle is equidistant from the center of the triangle.
7. The *centroid* is $\frac{2}{3}$ of the distance from each vertex to the midpoint of the opposite side.
8. To *inscribe* a circle about a triangle, you use the angle bisector
9. To *circumscribe* a circle about a triangle, you use the perpendicular bisector
10. Complete the following chart. Write if the point of concurrency is inside, outside, or on the triangle.

	Acute Δ	Obtuse Δ	Right Δ
Circumcenter	<u>inside</u>	<u>outside</u>	<u>on the triangle</u>
Incenter	<u>inside</u>	<u>inside</u>	<u>inside</u>
Centroid	<u>inside</u>	<u>inside</u>	<u>inside</u>
Orthocenter	<u>inside</u>	<u>outside</u>	<u>on the triangle</u>

In the diagram, the perpendicular bisectors (shown with dashed segments) of $\triangle ABC$ meet at point G —the circumcenter. and are shown dashed. Find the indicated measure.

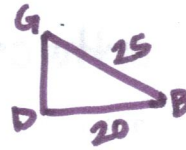
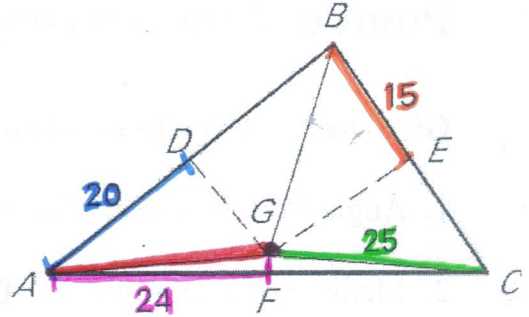
11. $AG =$ 25 12. $BD =$ 20

13. $CF =$ 24 14. $AB =$ 40

15. $CE =$ 15 16. $AC =$ 48

17. $m\angle ADG =$ 90

18. If $BG = (2x - 15)$, find x .



$$\begin{array}{r} 25 = 2x - 15 \\ +15 \quad \quad +15 \\ \hline 40 = \frac{2x}{2} \quad x = 20 \end{array}$$

$x =$ 20

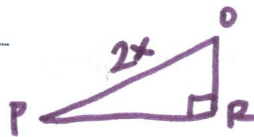
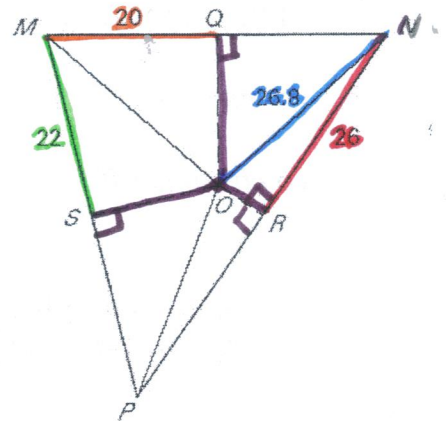
In the diagram, the perpendicular bisectors (shown with dashed segments) of $\triangle MNP$ meet at point O —the circumcenter. Find the indicated measure.

19. $MO =$ 26.8 20. $PR =$ 26

21. $MN =$ 40 22. $SP =$ 22

23. $m\angle MQO =$ 90°

24. If $OP = 2x$, find x .



$$\frac{26.8}{2} = \frac{2x}{2}$$

$$x = 13.4$$

$x =$ 13.4

Point T is the incenter of $\triangle PQR$.

25. If Point T is the incenter, then Point T is the point of concurrency of

the Angle Bisector.

26. $ST =$ 15

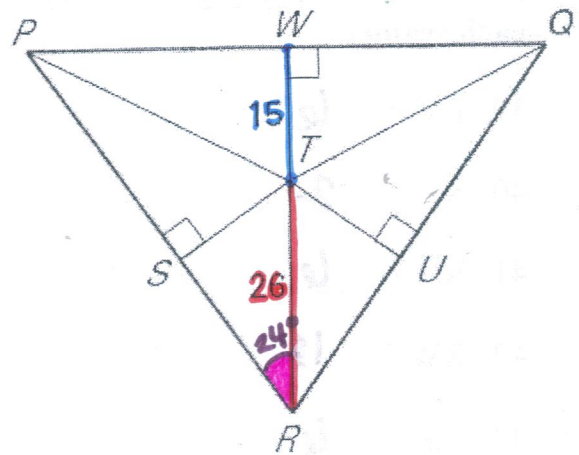
27. If $TU = (2x - 1)$, find x .

$$\begin{array}{r} 2x - 1 = 15 + 1 \\ + 1 \\ \hline 2x = 16 \\ \frac{2x}{2} = \frac{16}{2} \\ x = 8 \end{array}$$

$x =$ 8

28. If $m\angle PRT = 24^\circ$, then $m\angle QRT =$ 24°

29. If $m\angle RPQ = 62^\circ$, then $m\angle RPT =$ 31°



Point G is the centroid of $\triangle ABC$, $AD = 8$, $AG = 10$, $BE = 10$, $AC = 16$ and $CD = 18$. Find the length of each segment.

30. If Point G is the centroid, then Point T is the point of concurrency of

the Median.

31. $DB =$ 8

32. $EA =$ 15

33. $CG =$ 12

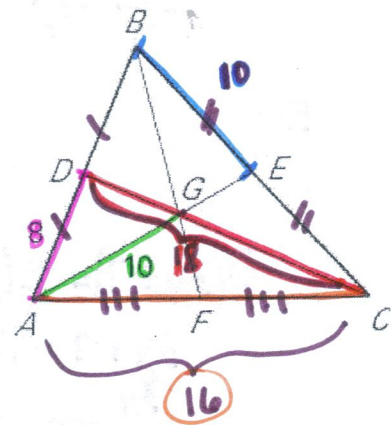
34. $BA =$ 16

35. $GE =$ 5

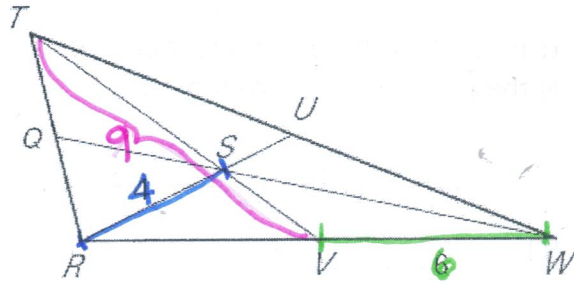
36. $GD =$ 6

37. $BC =$ 20

38. $AF =$ 8



Point S is the centroid of $\triangle RTW$, $RS = 4$, $VW = 6$, and $TV = 9$. Find the length of each segment.



39. $RV = \underline{6}$

40. $SU = \underline{2}$

41. $RU = \underline{6}$

42. $RW = \underline{12}$

43. $TS = \underline{6}$

44. $SV = \underline{3}$

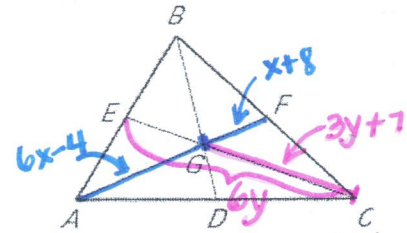
Point G is the centroid of $\triangle ABC$. Use the given information to find the value of the variable.

45. $FG = x + 8$ and $GA = 6x - 4$

$$\begin{aligned} 6x - 4 &= 2(x + 8) \\ 6x - 4 &= 2x + 16 \\ -2x + 4 & \quad -2x + 16 \\ \hline 4x &= 20 \\ \frac{4x}{4} &= \frac{20}{4} \end{aligned}$$

$x = 5$

$x = \underline{5}$



46. If $CG = 3y + 7$ and $CE = 6y$

$$\begin{aligned} \frac{2}{3}(6y) &= 3y + 7 \\ 4y &= 3y + 7 \\ -3y & \quad -3y \\ \hline y &= 7 \end{aligned}$$

$y = \underline{7}$