Geometry Worksheet
Equations of medians, altitudes & perpendicular bisectors

Name KEY
Date _____ **Period** _____

The vertices of ΔABC are A(2, 18), B(-2, -4), and C(6, 12)

1. Find the slope of $\overline{AB}$. $\frac{-4-18}{-2-2} = \frac{-22}{-4} = \boxed{\frac{11}{2}}$	2. Find the slope of $\overline{BC}$. $\frac{12+4}{6+2} = \frac{16}{8} = \boxed{2}$	3. Find the slope of $\overline{AC}$. $\frac{12-18}{6-2} = \frac{-6}{4} = \boxed{\frac{-3}{2}}$
4. Write the equation of the line containing $\overline{AB}$. $m = \frac{11}{2}$ $A(2,18)$ $B(-2,-4)$ $\boxed{y-18=\frac{11}{2}(x-2)}$ or $\boxed{y+4=\frac{11}{2}(x+2)}$	5. Write the equation of the line containing $\overline{BC}$ $m = 2$ $B(-2,-4)$ $C(6,12)$ $\boxed{y+4=2(x+2) \text{ or } y-12=2(x-6)}$	6. Write the equation of the line containing $\overline{AC}$ $m = -3/2$ $A(2,18)$ $C(6,12)$ $\boxed{y-18=-3/2(x-2) \text{ or } y-12=-3/2(x-6)}$
7. Find the equation of the line containing the altitude from C to $\overline{AB}$ $\perp m = -\frac{2}{11}$ $C(6,12)$ $\boxed{y-12=-2/11(x-6)}$	8. Write the equation of the line containing the altitude from A to $\overline{BC}$ $A(2,18)$ $\perp m = -1/2$ $\boxed{y-18=-1/2(x-2)}$	9. Find the equation of the line containing the altitude from B to $\overline{AC}$ $B(-2,-4)$ $\perp m = \frac{2}{3}$ $\boxed{y+4=2/3(x+2)}$
10. Find the coordinates of the midpoint of $\overline{AB}$ $\left(\frac{2-2}{2}, \frac{18-4}{2}\right) = \boxed{(0,7)}$	11. Find the coordinates of the midpoint of $\overline{BC}$ $\left(\frac{-2+6}{2}, \frac{-4+12}{2}\right) = \boxed{(2,4)}$	12. Find the coordinates of the midpoint of $\overline{AC}$ $\left(\frac{2+6}{2}, \frac{18+12}{2}\right) = \boxed{(4,15)}$
13. Find the equation of the line containing the median from C to $\overline{AB}$ $(6,12)(0,7)$ $m = \frac{7-12}{0-6} = \frac{-5}{-6} = 5/6$ $\boxed{y-12=5/6(x-6) \text{ or } y=5/6x+7}$	14. Find the equation of the line containing the median from A to $\overline{BC}$ $(2,18)(2,4)$ $\boxed{x=2}$	15. Find the equation of the line containing the median from B to $\overline{AC}$. $(-2,-4)(4,15)$ $m = \frac{15+4}{4+2} = \frac{19}{6}$ $y+4=\frac{19}{6}(x+2)$ or $y-15=\frac{19}{6}(x-4)$

16. Find the equation of the line containing the perpendicular bisector of $\overline{AB}$ $(0,7)$ mid. $\perp m = -2/11$ $y = -2/11\,x + 7$	17. Find the equation of the line containing the perpendicular bisector of $\overline{BC}$ $(2,4)$ $\perp m = -1/2$ $y - 4 = -1/2\,(x-2)$	18. Find the equation of the line containing the perpendicular bisector of $\overline{AC}$ $(4,15)$ $\perp m = \frac{2}{3}$ $y - 15 = 2/3\,(x-4)$

Given: R(0, 10), S(-5, 0), and T(5, 5). Write the equation of:

19. the median from R midpoint $\overline{ST} = (0, \frac{5}{2})$ $R(0, 10)$ $x = 0$	20. the median from S mid. of $\overline{RT}$ $(5/2, 7/2)$ $S(-5, 0)$ median slope: $\frac{-3.5}{-7.5} = \frac{7}{15}$ $y - 7/2 = 7/15\,(x - 5/2)$ or $y = 7/15\,(x+5)$	21. the median from T $(5,5)$ mid $\overline{RS}$ $(-5/2, 5)$ $y = 5$
22. the altitude from T slope of $RS = 2$ $\perp m = -1/2$ $T(5,5)$ $y - 5 = -1/2\,(x-5)$	23. the altitude from R $(0,10)$ slope $\overline{ST} = 1/2$; $\perp m = -2$ $y = -2x + 10$	24. the altitude from S $(-5,0)$ Slope $\overline{RT} = -1$ $y = -(x+5)$ or $y = -x - 5$
25. the perpendicular bisector of segment RS midpoint RS $(-\frac{5}{2}, 5)$ $\perp m = -1/2$ $y - 5 = -1/2\,(x + 5/2)$	26. the perpendicular bisector of segment ST midpoint $\overline{ST}$ $(0, 5/2)$ slope $\overline{ST} = 1/2$; $\perp m = -2$ $y = -2x + 5/2$	27. the perpendicular bisector of segment RT $\perp m$ $RT = 1$ $(5/2, 7/2)$ mid $\overline{RT}$ $y - 7/2 = 1(x - 5/2)$ or $y - 7/2 = x - 5/2$