Example 4

Find the coordinates of the orthocenter of the triangle with the given vertices.

12. $J(1, 0)$, $H(6, 0)$, $I(3, 6)$

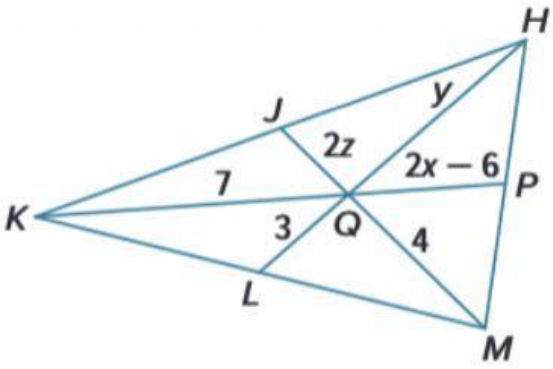
13. $S(1, 0)$, $T(4, 7)$, $U(8, -3)$

14. $L(8, 0)$, $M(10, 8)$, $N(14, 0)$

15. $D(-9, 9)$, $E(-6, 6)$, $F(0, 6)$

Mixed Exercises

16. **REASONING** In the figure at the right, if J, P, and L are the midpoints of $\overline{KH}$, $\overline{HM}$, and $\overline{MK}$, respectively, find x, y, and z.



Given $\triangle RST$ with medians $\overline{RM}$, $\overline{SL}$, and $\overline{TK}$, and centroid J, find each value of x.

17. $SL = x(JL)$

18. $JT = x(TK)$

19. $JM = x(RJ)$

For Exercises 20 and 21, refer to the figure at the right.

20. If $\overline{EC}$ is an altitude of $\triangle AED$, $m\angle 1 = 2x + 7$, and $m\angle 2 = 3x + 13$, find $m\angle 1$ and $m\angle 2$.

21. Find the value of x if $AC = 4x - 3$, $DC = 2x + 9$, $m\angle ECA = 15x + 2$, and $\overline{EC}$ is a median of $\triangle AED$. Is $\overline{EC}$ also an altitude of $\triangle AED$? Explain.