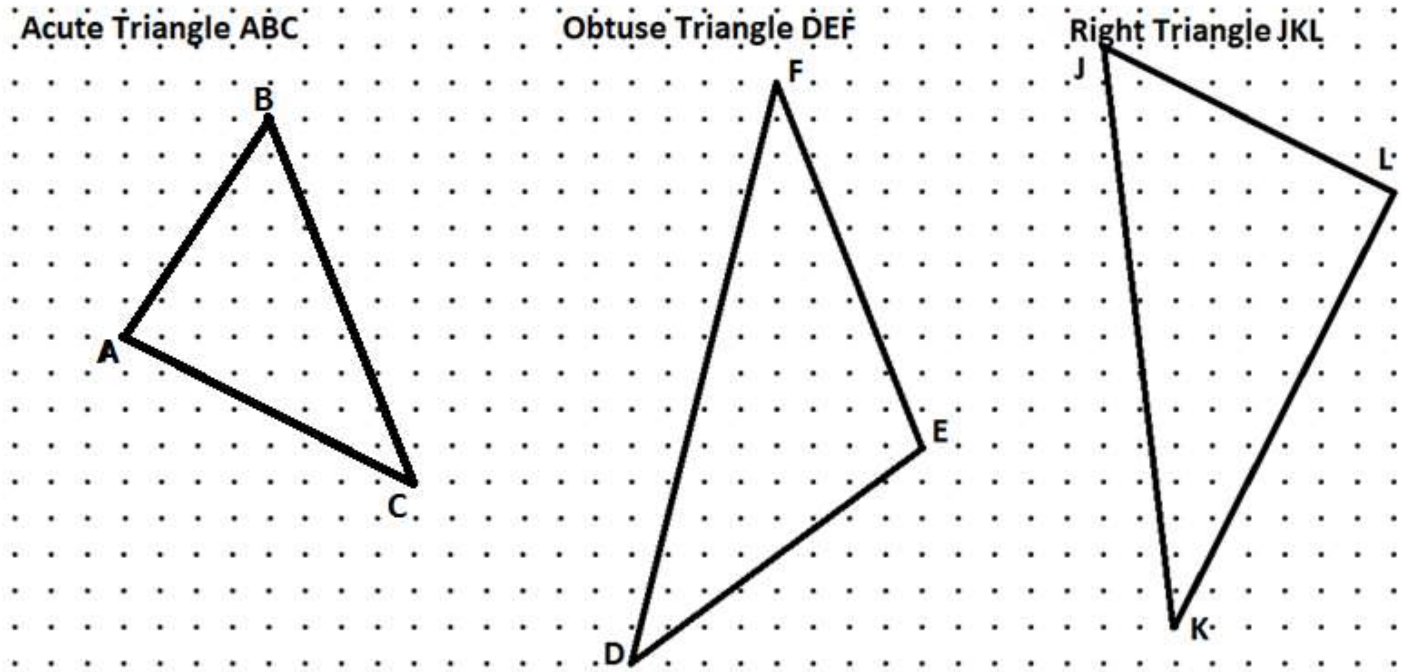
Geometry HW October 23, 2013 Name____
More Shortest Distance Concepts period 1 2 3 5 6

CONCEPT review: In the HW on Tuesday Oct 22

1 Given the three triangles, one acute, one obtuse and one right, draw the perpendicular bisectors of each side of the triangle by

- locating and labeling the midpoints of each side M1, M2 and M3.
- determining the slope of each side of the triangle
- drawing the line perpendicular to each side through the midpoint… extend these lines and use arrows

When you are finished, each triangle should have three perpendicular bisectors, one to each side.



What observation can be made about the three perpendicular bisectors of a triangle?
Describe what the three perpendicular bisectors have in common.

All three perpendicular bisectors intersect at a single point. We call this intersection point a **point of concurrency**.

Complete the conjecture statement for each triangle:

For the acute triangle, the point of concurrency for the perpendicular bisectors lies __________________ the triangle.

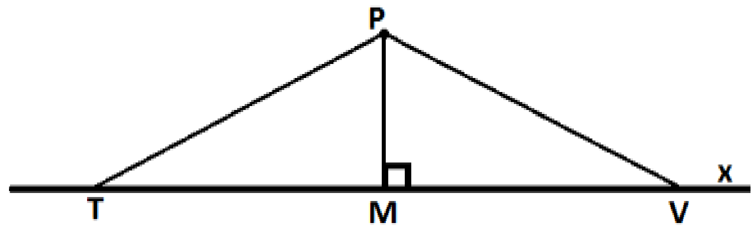
For the obtuse triangle, the point of concurrency for the perpendicular bisectors lies _________________ the triangle.

For the right triangle, the point of concurrency for the perpendicular bisectors lies ___________________ the triangle.

Do you think that your conjectures will always be true?____

2 Point P has coordinates $(-1,6)$ and you need to find points T and V on the x-axis that are 10 units away from P.

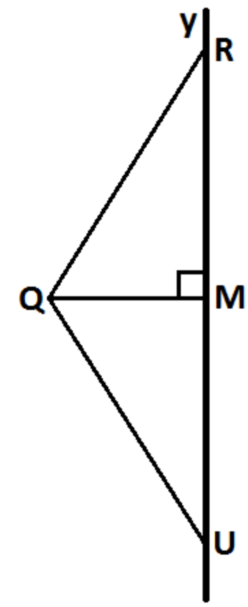
Label the diagram (not drawn to scale) to represent this information.



With the diagram labeled, show work to find the distances TM and MV.

List the coordinates of each point on the x-axis: $T(\_\_\_\_,\_\_\_\_)$ $M(\_\_\_\_,\_\_\_\_)$ $V(\_\_\_\_,\_\_\_\_)$

3 Point Q has coordinates $(-8,3)$ and you need to find points R and U on the y-axis that are 17 units away from Q. Label the diagram (not drawn to scale) to represent this information.

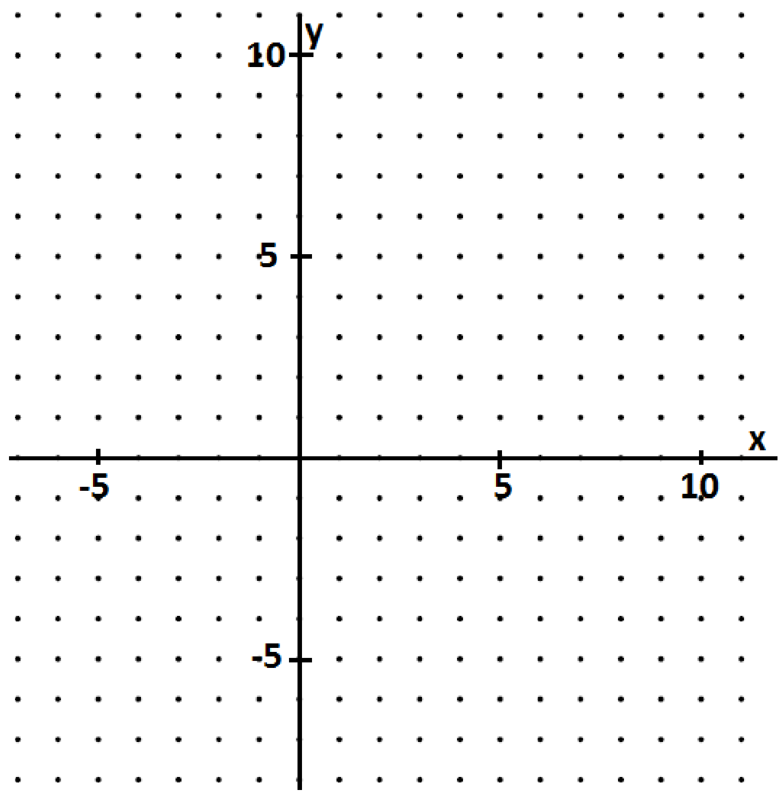


With the diagram labeled, show work to find the distances RM and MU.

List the coordinates of each point on the x-axis: $R(\_\_\_\_,\_\_\_\_)$ $M(\_\_\_\_,\_\_\_\_)$ $U(\_\_\_\_,\_\_\_\_)$

4 Graph the line ℓ, and plot point A. Label both on the graph.

$Line: y = \frac{3}{2}(x-1)+2$ point: $A(10,-4)$



Draw a segment representing the shortest distance from point A to line ℓ.

Show work to determine the length of this "shortest distance" segment.

Find two lattice points on line ℓ that are 13 units from point A. (Use the concepts from question 2 and 3 above)

Label the two points B and C on your graph

List the coordinate of these two points.

$B(\_\_\_\_,\_\_\_\_)$ and $C(\_\_\_\_,\_\_\_\_)$