**MPM 2D0 More Triangle Problems**

1. a) Graph $\triangle DEF$ with vertices D(-2,0), E(4,-3) and F(8,8).

   i) Draw the median from D to the midpoint of EF.
   ii) Draw the altitude from F to DE
   iii) Draw the perpendicular bisector of DF.

   b) Determine the equation of each line you drew in part a)

2. Points G(-5,-3), H(7,1) and J(-3,7) are the vertices of a triangle.

   a) Determine the equations of the three sides.
   b) Determine the equation of the perpendicular bisector of each side.

3. A triangle has vertices P(8,8), Q(5,-7) and R(-5,-5).

   a) Determine the length of the median from Q to RP.
   b) Determine the perimeter of the triangle.
   c) Determine the area of the triangle.

4. Consider the points A(-3,1), B(1,5) and C(-2,8).
   a) Verify the $\triangle ABC$ is a right angled triangle.
   b) Is $\triangle ABC$ and isosceles triangle? Justify your answer.
   c) Verify the Pythagorean Theorem for $\triangle ABC$.

5. The equations $y = 2$, $y = 4x - 2$ *and* $y = -2x + 10$ form the sides of a triangle.
   a) Graph the triangle, and determine the coordinates of the vertices.
   b) Calculate the area of the triangle.

6. A triangle has vertices at D(-5,4), E(1,8) and F(-1,-2). Show that the height from D is also the median from D.

7. $\triangle DEF$ has vertices at D(2,8), E(6,2) and F(-3,2). Use analytic geometry to determine the coordinates of the orthocenter (the point where the altitudes intersect)

8. $\triangle PQR$ has vertices at P(-12,6), Q(4,0) and R(-8,-6). Use analytic geometry to determine the coordinates of the centroid (the point where the medians intersect).

9. $\triangle JKL$ has vertices at J(-2,0), K(2,8) and L(7,3). Use analytic geometry to determine the coordinates of the circumcentre (the point where the perpendicular bisectors intersect).