Higher Homework 01

1) Express each of the following in the form $(x + a)^2 + b$

a) $x^2 + 10x + 16$ b) $x^2 - 6x - 2$

c) $x^2 + x - 6$ d) $x^2 - 3x - 7$

2) Solve the following inequalities.

a) $x^2 - 2x - 3 \leq 0$ b) $5x^2 - 80 > 0$

c) $-2x^2 + x + 3 < 0$ d) $4x^2 - 24x + 35 \geq 0$

3) D is the point (3,3), E is the point (1,-7) and F is the point (9,-3).

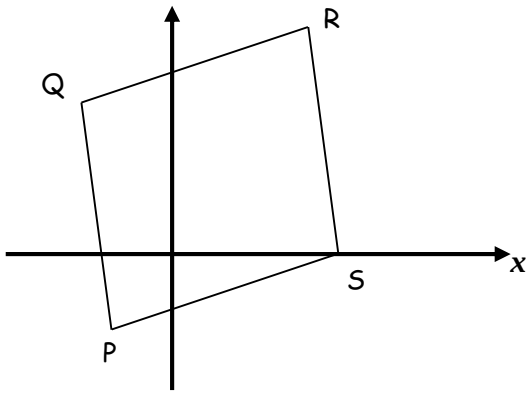
a) Find the equation of the altitude from D of triangle DEF.

b) Find the equation of the perpendicular bisector of DF.

c) Find the coordinates of the point of intersection of these two lines.

4) The diagram shows a rhombus PQRS with its diagonals PR and QS.

PR has equation $y = 2x - 2$.
Q has coordinates (-2,4).



a) i) Find the equation of the diagonal QS.

ii) Find the coordinates of T, the point of intersection of PR and QS.

b) R is the point (5,8). Write down the coordinates of P.

5) Triangle ABC has vertices A (-2,3), B (8,5) and C (2,-4).

a) Find the equation of the median CD.

b) Find the equation of the altitude AE.

c) Find the coordinates of the point of intersection of these two lines.

6) A straight line makes an angle of 135° with the positive x – axis.
It passes through the point (-8,3).
Find the equation of this line.

7) Find the perimeter of this triangle.