Inflexion and Stationary Points

1) By study of any stationary and inflexion points sketch the curve

$$y = -x^3 + 6x^2 - 9x$$

2) Show that the curve $y = x(x-1)(x-2)$ has a point of inflexion which is not a stationary point. Determine its nature .... ie. does it go / or \ ?

3) A curve has equation $y = x^3 + ax^2 + bx + c$.
The curve passes through the origin and has a point of inflexion at the point $(1, {}^2/_3)$.

a) Find the values of a, b and c

b) Find the equation of the tangent to the curve at the origin.

4) A cubic curve has equation $y = ax^3 + bx^2 + cx + d$ and passes through the origin.
The curve has a point of inflexion at $(2, -22)$.
The equation of the tangent to this curve at the origin is $y + 3x = 0$

a) By looking at the origin show $d = 0$

b) By looking at the tangent at the origin show $c = -3$

c) Determine the full equation of the curve.