Name: _____

1. $A(-3, 4)$ and $B(1, 6)$. The perpendicular bisector of $AB$ intersects the coordinate axes at the points $C$ and $D$.

(a) Find the equation of the perpendicular bisector of $AB$.

(b) Find the points $C$ and $D$ and hence find the area of the triangle $OCD$, where $O$ is the origin.

2. Find the set of values of $x$ that satisfy

$$\frac{27}{2x-1} < 3$$

3. $\text{f}(x) = 2x^3 + ax^2 - x + 6$ has a factor $(x + 1)$

Find the value of $a$ and hence factorise $\text{f}(x)$ fully into a product of linear factors.

4. The line $l$ has equation $y = 5 - 2x$. The line $l$ is parallel to the tangent to the curve

$y = \frac{1}{2}x^4 - \frac{5}{3}x^3 - \frac{1}{2}x^2 + 4x + 1$ at the point $P$. Find

the possible $x$ coordinates of the point $P$.

[hint: your answer to Q3 will be helpful]