GRAPH INTERSECTIONS

TASK A

Identify which of the following describes the graphs of these equations without sketching the graphs. Make sure to show your working
- The straight line cuts the curve twice
- The straight line is a tangent to the curve
- The straight line and the curve do not intersect.

$y = x^2 + x + 1$ $y = x + 1$	$2x^2 - y^2 = 5$ $4y + 2x + 10 = 0$	$x^2 + y^2 = 22$ $y + 4x + 7 = 0$
$x^2 + 12y^2 = 3$ $4x - 2y + 7 = 0$	$x^2 + 2x - 2y^2 + 5 = 0$ $x - 3y - 2 = 0$	$y = 2x^2 + 4x - 4$ $y + 9x = 5$

TASK B

1) The two graphs

$$y = 4x + 1$$
$$y = x^2 + kx + 6$$

Intersect at the points $(1, p)$ and (a, b)

Find a, b, k and p

2) The line $y = 3x - 3$ is a tangent to the graph $y = x^2 + 5x + k$

Find the value of k and the coordinates of the point where the graphs meet.