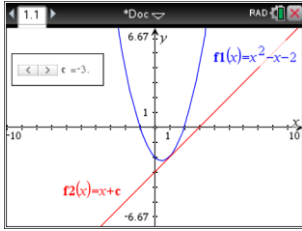


Mathematical Methods Unit One Intersection of a Line and a Parabola Assignment



Due Date: _____

Name: _____

Please write your answers on paper. Staple all pages and submit on a due date.

1. For what values of c does the line with equation $y = 2x + c$ touch the parabola with equation $y = x^2 + x - 3$?
2. For what values of m does the line with equation $y = mx - 1$
 - a) touch, b) intersect c) do not intersect the parabola with equation $y = 2x^2$?
3. For what values of k has the equation $3x^2 - 10x + 8 - k = 0$ only one solution?
4. Show that the solutions of the equation $(2m + 1)x^2 - 2m^2x - m^2 = 0$ are rational, for all real values of m .
5. Find the equations of the two lines that contain the point $(0, -2)$ and are tangents to the parabola with equation $y = x^2 - 3x + 2$.
6. Solve algebraically the following simultaneous equations: $y = x - 1$ and $y = \frac{4}{x + 2}$.
Check your answer on your CAS calculator. Illustrate with an appropriate diagram.
7. For what values of c will a straight line with equation $y = 2x + c$ be a tangent to a circle $x^2 + y^2 = 4$? For your values of c find the coordinates of two points where the tangents meet the circle.
8. Find the values of k for which the equation $x^2 - kx - k + 8 = 0$ has no real solutions.