WORKSHOP 1·8

Handout

Question: Let

$$f(x) = \begin{cases} 2x^2 + x + 1 & \textbf{if } x < 0 \\ (c+3)^3 x + (c+3)^2 & \textbf{if } x \geq 0 \end{cases}$$

1. **Using the limit definition of the derivative, find the value of c such that f is continuous everywhere and differentiable at all but one point.**
2. **Using the limit definition of the derivative, find the value of c such that the tangent lines to the graph of f at $x = -7$ and $x = 5$ are parallel to each other.**