Zoom In Maths Grade 12

Worksheet

1.2

Exam-type questions

- **1. 1.1** Determine f'(x) from first principles if $f(x) = 4x^2$.
 - Determine: **1.2.1** $D_x \left[\frac{x^2 - 2x - 3}{x + 1} \right]$ **1.2.2** f''(x) if $f(x) = \sqrt{x}$
- **2.** The sketch below represents the curve of $f(x) = x^3 + bx^2 + cx + d$. The solutions of the equation f(x) = 0 are -2; 1 and 4.



- **2.1** Calculate the values of *b*, *c* and *d*.
- 2.2 Calculate the *x*-coordinate of B, the maximum turning point of *f*.
- **2.3** Determine an equation for the tangent to the graph of f at x = -1.
- **2.4** Sketch the graph of f''(x). Clearly indicate the *x* and *y*-intercepts on your sketch.
- **2.5** For which value(s) of x is f(x) concave upwards?

3. Given: $f(x) = -3x^3 + x$. Calculate the value of *q* for which f(x) + q will have a maximum value of $\frac{8}{9}$.