5 The polynomial $\mathrm{p}(x) = ax^3 + bx^2 + 6x + 4$, where a and b are integers, is divisible by $x - 2$. When $\mathrm{p}'(x)$ is divided by $x + 1$ the remainder is -7.

(a) Find the value of a and of b. [5]

(b) Using your answers to **part (a)**, find the remainder when $\mathrm{p}''(x)$ is divided by x. [2]

6 A curve with equation $y = \mathrm{f}(x)$ is such that $\dfrac{\mathrm{d}^2y}{\mathrm{d}x^2} = 6\mathrm{e}^{3x} + 4x$. The curve has a gradient of 5 at the point $\left(0, \dfrac{5}{3}\right)$. Find $\mathrm{f}(x)$. [7]

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