Homework 10

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An exercise marked with the symbol $\star$ is considered more difficult and will not be an exam question.

Exercise 1 Find the most general antiderivative of the following functions.

(1) $f(x) = x^2 - 3x + 2$

(2) $f(x) = 6x^5 - 8x^4 - 9x^2$

(3) $f(x) = (x-5)^2$

(4) $f(x) = x^{3.4} - 2x^{\sqrt{2}-1}$

(5) $f(x) = e^2$

(6) $f(x) = \sqrt[3]{x^2} + x\sqrt{x}$

(7) $\star f(t) = \frac{3t^4 - t^3 + 6t^2}{t^4}$

(8) $r(\theta) = \sec(\theta)\tan(\theta) - 2e^\theta$

(9) $g(v) = 2\cos(v) - \frac{3}{\sqrt{1-v^2}}$

(10) $f(x) = 1 + 2\sin(x) + \frac{3}{\sqrt{x}}$

(11) $f(x) = \frac{2x^2+5}{x^2+1}$

Exercise 2 Find f.

(1) $f''(x) = x^6 - 4x^4 + x + 1$

(2) $f''(x) = \frac{1}{x^2}$

(3) $f'''(t) = \sqrt{t} - 2\cos(t)$

(4) $f'(x) = 5x^4 - 3x^2 + 4$ where $f(-1) = 2$

(5) $f'(t) = t + \frac{1}{t^3}$ where $t > 0$ and $f(1) = 6$

(6) $f'(x) = \frac{x+1}{\sqrt{x}}$ where $f(1) = 5$

(7) $f'(t) = 3^t - 3/t$ where $f(1) = 2$ and $f(-1) = 1$

(8) $f''(x) = 8x^3 + 5$ where $f(1) = 0$ and $f'(1) = 8$

(9) $f''(t) = t^2 + \frac{1}{t^2}$ where $t > 0$ and $f(2) = 3$ and $f'(1) = 2$

(10) $f''(t) = \sqrt[3]{t} - \cos(t)$ where $f(0) = 2$ and $f(1) = 2$

(11) $f'''(x) = \cos(x)$ where $f(0) = 1$, $f'(0) = 2$ and $f''(0) = 3$