

Total time: 15 minutes.

Problem 1 (2 points each). Calculate indefinite integrals:

$$(1) \int \left(2 \sin x - \frac{3}{\sqrt{1-x^2}} \right) dx = -2 \cos x - 3 \sin^{-1} x + C$$

($-2 \cos x + 3 \cos^{-1} x + C$ is also correct)

$$(2) \int \frac{(x^2 - 1)^2}{x^3} dx = \int (x - 2x^{-1} + x^{-3}) dx = \frac{1}{2}x^2 - 2 \ln |x| - \frac{1}{2}x^{-2} + C$$

Problem 2 (6 points). Let $f(x) = x^3$. Write the right endpoint approximation with $n = 100$ for the area under $y = f(x)$ on $[1, 4]$. (You don't need to calculate it)

$$x_0 = 1, \quad \Delta x = \frac{4-1}{100} = \frac{3}{100}, \quad x_i = 1 + \frac{3}{100}i$$

right endpoint approximation:

$$\sum_{i=1}^{100} \left(1 + \frac{3}{100}i \right)^3 \cdot \frac{3}{100}$$