

Honors Math 181 Homework 9 Version A

1. Use the integral rules to find the following integrals:

(i) $\int_1^2 \left(\frac{1}{x^2} + \frac{1}{x} + 1 + x + x^2 \right) dx$

(ii) $\int_0^1 \ln(4x^2 + 12x + 5) dx$

(iii) $\int_{-3}^3 5^{|x/3|} dx$

(iv) $\int_0^{1/2} \arcsin 2x dx$

(v) $\int_0^{\sqrt{3}} \arccos(x/2) dx$

(vi) $\int_0^{\pi/12} \sin x \cos 5x dx$

(vii) $\int_0^1 \frac{1}{3x+4} dx$

2. Use either of the limit definitions of derivative

$$f'(x) = \lim_{\xi \rightarrow x} \frac{f(\xi) - f(x)}{\xi - x} \quad \text{or} \quad f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

to find the following derivatives:

(i) Find $f'(3)$ for $f(x) = x^2$.

(ii) Find $g'(4)$ for $g(x) = \sqrt{x}$.

(iii) Find $h'(2)$ for $h(x) = 1/x$.