

Honors Math 181 Homework 10 Version A

1. Find the following limits:

(i) $\lim_{n \rightarrow \infty} n(5^{1/n})$

(ii) $\lim_{x \rightarrow 0} \frac{\tan 3x}{x}$

2. Find the following integrals:

(i) $\int_0^3 x^2(x+1) dx$

(ii) $\int_0^3 \sqrt{x+1} dx$

(iii) $\int_1^e \ln(2x) dx$

3. Find the following derivatives:

(i) $\frac{d}{dx}(x^2 + x + 3)$

(ii) $\frac{d}{dx}((x^2 + 1)(x^2 - 1))$

(iii) $\frac{d}{dx}(x^2 e^x)$

(iv) $\frac{d}{dx}\left(\frac{x^2}{1 + e^x}\right)$

(v) $\frac{d}{dx}(\sin 2x)$

(vi) $\frac{d}{dx}(\cos^2 x)$

(vii) $\frac{d}{dx} \ln(2 + \cos x)$

(viii) $\frac{d}{dx}(x \ln x)$

(ix) $\frac{d}{dx}(\arctan x^2)$

(x) $\frac{d}{dx}|x^3|$