

# INTRODUCTION TO CALCULUS

MATH 1A

UNIT 24: WORKSHEET

## Integral Drill

### Problem 1: Level 1

- a)  $\int x^5 dx$
- b)  $\int \sin(x) dx$
- c)  $\int \frac{1}{x} dx$

### Solution:

- a)  $x^6/6 + C$
- b)  $-\cos(x) + C$
- c)  $\ln(x) + C$

### Problem 2: Level 2

- a)  $\int 4x^{-3} dx$
- b)  $\int \cos(3x) dx$
- c)  $\int \frac{1}{1+x^2} dx$

### Solution:

- a)  $-2x^{-2} + C$
- b)  $\sin(3x)/3 + C$
- c)  $\arctan(x) + C$

### Problem 3: Level 3

- a)  $\int x^5 + x^2 + x + 1 dx$
- b)  $\int \sin(14x) + \cos(3x) + \frac{1}{x^2} dx$
- c)  $\int 17 \frac{1}{\cos^2(x)} + x^9 dx$

**Solution:**

- a)  $x^6/5 + x^3/3 + x^2/2 + x + C$   
 b)  $-\cos(14x)/14 + \sin(3x)/3 - \frac{1}{x}$   
 c)  $17 \tan(x) + \frac{x^{10}}{10}$

**Problem 4: Level 4**

- a)  $\int \frac{1}{7+x} dx$   
 b)  $\int \sin(3+2x) + \frac{8}{\sin^2(x)} dx$   
 c)  $\int \cos(x^2)2x dx$

**Solution:**

- a)  $\ln(7+x) + C$   
 b)  $-\cos(3+2x)/2 - 8 \cot(x)$   
 c)  $\sin(x^2)$

**Problem 5: Level 5**

- a)  $\int \frac{1}{x \ln(x)} dx$   
 b)  $\int \sin(9+2x^2)x dx$   
 c)  $\int \ln(x)/x dx$

**Solution:**

- a)  $\ln(\ln(x)) + C$ .  
 b)  $-\cos(9+2x^2)/4$ .  
 c)  $\ln^2(x)/2 + C$

In case you need some motivation for this drill, we asked midjourney to have some drill sergeant yell at us. We all sometimes need a bit of a push!

