

## MATH 3B WORKSHEET 5

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### 1. INTEGRATE BY PARTS

#### 1.1. Set I.

- (1)  $\int (5x + 4)^{100} dx$
- (2)  $\int 3t^2 (t^3 + 4)^5 dt$
- (3)  $\int \sqrt{4x - 5} dx$
- (4)  $\int \frac{2t^2}{\sqrt{t^3+4}} dt$
- (5)  $\int \cos(2x + 1) dx$
- (6)  $\int \sin^9 t \cos t dt$
- (7)  $\int x e^{x^2} dx$

#### 1.2. Set II.

- (1)  $\int \tan x \sec^4 x dx$
- (2)  $\int \frac{(\sqrt{x}-1)^2}{\sqrt{x}} dx$
- (3)  $\int \sqrt{x^3 + x^2} (3x^2 + 2x) dx$
- (4)  $\int_{-1}^1 \frac{x+1}{(x^2+2x+3)^3} dx$
- (5)  $\int_0^{\pi/2} \sin x \sqrt{\cos x} dx$
- (6)  $\int (x + 1) \sin(x^2 + 2x + 3) dx$
- (7)  $\int \left(1 + \frac{1}{t}\right)^3 \frac{1}{t^2} dt$

#### 1.3. Set III.

- (1)  $\int_{-1}^1 x^2 \sqrt{x^3 + 1} dx$
- (2)  $\int \frac{2}{\sqrt{3x-7}} dx$
- (3)  $\int_1^4 \frac{1}{\sqrt{x}(\sqrt{x+1})^2} dx$
- (4)  $\int_0^1 \frac{x}{\sqrt{x+1}} dx$
- (5)  $\int x \sqrt{2x + 1} dx$
- (6)  $\int \sqrt{x} \sqrt{x \sqrt{x} + 1} dx$
- (7)  $\int_1^4 \frac{dx}{1+\sqrt{x}}$

1.4. **Set IV.**

- (1)  $\int x^3 \sqrt{x^2 + 1} dx$
- (2)  $\int (x^2 + 1) \sqrt{x - 2} dx$
- (3)  $\int \frac{x^2 + 2x}{x^2 + 2x + 1} dx$
- (4)  $\int \frac{dx}{x^2 + 6x + 9}$
- (5)  $\int \frac{dx}{\cos^2 x (1 + \tan x)^3}$
- (6)  $\int x \tan(x^2) \sec^5(x^2) dx$

1.5. **\*Set V.**

- (1)  $\int (\tan(2x) + \cot(2x))^2 dx$
- (2)  $\int_0^a \sqrt{a^2 - x^2} dx.$
- (3)  $\int_0^\pi \sqrt{\sin^3 x - \sin^5 x} dx$
- (4)  $\int \frac{dx}{x \ln x \ln(\ln x)}$
- (5)  $\int_0^3 \frac{x^2}{(x^2 - 2x + 2)^2} dx$
- (6)  $\int_0^\pi (1 - \sin^3 \theta) d\theta$
- (7)  $\int_0^1 (x - x^2) \sqrt{1 - x^2} dx$
- (8)  $\int_0^\pi e^{\sin^2 x} \cos x dx$

## 2. QUIZZES

NAME:----- PERM:----- SECTION TIME:-----

Integrate

$$\int_0^{\pi/3} \frac{\sin x dx}{(2 + 3 \cos x)^2}.$$