Integration

Simplify:

1. $\int 8\,dx$
2. $\int x^{-5}\,dx$
3. $\int 2x-7\,dx$
4. $\int \frac{1}{3x}dx$
5. $\int \sin 5x\,dx$
6. $\int \cos(x+3)\,dx$
7. $\int e^{-3x}dx$
8. $\int x(x-1)\,dx$
9. $\int \frac{1}{x^2+5^2}dx$

Substitution:

1. $\int (2x^3+1)^7 x^2 dx$
2. $\int x\sin(x^2)\,dx$
3. $\int \sin^3 x\cos x\,dx$
4. $\int \frac{x^5+x^3+2}{1+x^2}dx$

By Parts:

1. $\int x^2 e^{2x} dx$

2. $\int e^{2x} \cos x \, dx$

By Partial fractions:

1. $\int \frac{5x^2 - 10x - 8}{x^3 - 4x} dx$

2. $\int \frac{1}{x^2(x-1)(x^2+3)(x^3+2x^2-x+1)}dx$: write in the form of partial fractions but do not solve.

Definite Integral:

1. Evaluate: $\int_1^5 (3x^2+4x+1)dx$

2. Find the displacement of an object from t = 2 to t = 3, if the velocity of the object at time t is given by:

$$\int_2^3 \frac{t^2+1}{(t^3+3t)^2}dt$$