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WORKSHEET

## TECHNIQUES OF INTEGRATION

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## QUESTION 1

Integrate the following expressions with respect to  $x$ .

(a)  $10x^4 - 5x^2 + x + 3$

(b)  $6\sqrt[3]{x} - \frac{2}{\sqrt{x}} + 8x^3$

(c)  $\frac{4\sqrt[3]{x} + 3x^4 + \sqrt{x}}{6x^3}$

## QUESTION 2

Integrate the following expressions with respect to  $x$ .

(a)  $\int \frac{5}{6x} dx$

(b)  $\int \frac{1}{4x-3} dx$

(c)  $\int \frac{8+(4x-3)^5}{(4x-3)^6} dx$

(d)  $\int \frac{5}{2-5x} dx$

## QUESTION 3

Integrate the following expressions with respect to  $x$ .

(a)  $\int e^{2x-1} dx$

(b)  $\int \frac{e^{4x} + 5}{e^{4x}} dx$

(c)  $\int \frac{(e^{2x} - e^x)^2}{e^x} dx$

(d)  $\int \frac{1 - e^{4-3x}}{e^{4-3x}} dx$

*Worksheet: Techniques of Integration***QUESTION 4**

Integrate the following expressions with respect to  $x$ .

(a)  $7 \cos 3x + \sec^2 x$

(b)  $\frac{1}{x^3} - \sin(5x+2)$

(c)  $\sin 3x - \sec^2 6x$

**QUESTION 5**

Integrate the following expressions with respect to  $x$ .

(a)  $3 \sec^2 4x + \sin 3x$

(b)  $6 \cos 2x - \sec^2 2x + \sqrt{x}$

(c)  $\sin^2 2x + \cos^2 x$

**QUESTION 6**

Show that  $\frac{d}{dx}[(2x-1)\sqrt{x+3}] = \frac{6x+11}{2\sqrt{x+3}}$ . Hence, find  $\int \frac{6x+11}{\sqrt{x+3}} dx$ .