King Saud University

College of Sciences

Department of Mathematics

106 Math Exercises

(13)

Miscellaneous Substitutions

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Q . Evaluate the following integrals :

1)

$$\int x\sqrt[3]{x+9}\ dx$$

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2)

$$\int \frac{1}{\sqrt{x}+4}\ dx$$

3)

$$\int \frac{1}{\sqrt{\sqrt{x}+4}}\,dx$$

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4)

$$\int \frac{1}{(x+1)\sqrt{x-2}}\,dx$$

5)

$$\int_3^8 \frac{\sqrt{1+x}}{x}\,dx$$

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6)

$$\int \sqrt{1+\sqrt{x}}\;\,dx$$

7)

$$\int \frac{1}{1-\sqrt{x}}\,dx$$

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8)

$$\int \frac{\sqrt{x}}{1+\sqrt[3]{x}}\,dx$$

9)

$$\int \frac{1}{\sqrt[4]{x}+\sqrt[3]{x}}\,dx$$

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10)

$$\int \frac{1}{x^{2/3}+x^{4/3}}\,dx$$

$x = u^3$

11)

$$\int \frac{1}{\sqrt[3]{x} - \sqrt{x}}\, dx$$

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12)

$$\int \frac{\sqrt{x}}{x^{1/3} + x^{2/3}}\, dx$$

13)

$$\int \frac{1}{2+sinx}\,dx$$

$: u = tan\frac{x}{2}$, $dx = \frac{2du}{1+u^2}$ $sinx = \frac{2u}{1+u^2}$ $cosx = \frac{1-u^2}{1+u^2}$

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14)

$$\int \frac{1}{3+2cosx}\,dx$$

15)

$$\int \frac{1}{1+sinx+cosx}\,dx$$

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16)

$$\int \frac{1}{sinx+cosx}\,dx$$