

# WORKSHEET XVIII

## REVIEW: SUBSTITUTION

Use the *method of substitution* to evaluate each of the following indefinite integrals.

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

$$(b) \int x(x+1)^{\frac{1}{3}} dx$$

$$(c) \int x^2(x+1)^{19} dx$$

$$(d) \int \tan x dx = \int \frac{\sin x}{\cos x} dx$$

$$(e) \int \sec x dx = \int \frac{\sec^2 x + \sec x \tan x}{\sec x + \tan x} dx$$

$$(f) \int \tan(4x)\sec^2(4x) dx$$

$$(g) \int \frac{x}{\sqrt{1-x^4}} dx$$

$$(h) \int \frac{e^x}{1+e^{2x}} dx$$

$$(i) \int \frac{\sin z}{(3+2\cos z)^2} dz$$

$$(j) \int \frac{x^2-5}{x+2} dx$$

$$(k) \int \frac{\sqrt{t}}{\left(1+t^{\frac{3}{2}}\right)^2} dt$$

$$(l) \int \frac{\sqrt{\ln x}}{x} dx$$

$$(m) \int x^7(5+x^8)^5 dx$$

$$(n) \int \frac{\sec^2 y}{1 - \tan y} dy$$

$$(o) \int (\tan^4 u)(\sec^2 u) du$$

$$(p) \int \sqrt{a + bx} dx$$

$$(q) \int \sqrt{3 + \sqrt{x}} dx$$

$$(r) \int \frac{\sin \sqrt{x+1}}{\sqrt{x+1}} dx$$

$$(s) \int \frac{1}{\sqrt{1 + \sqrt{x}}} dx$$

$$(t) \int \frac{(\sin x + \cos x)}{\sqrt[3]{\sin x - \cos x}} dx$$

$$(u) \int \frac{x}{\sqrt{1+x^2} + \sqrt{(1+x^2)^3}} dx$$

$$(v) \int \frac{(x^2 + 1 - 2x)^{1/5}}{1-x} dx$$

*What we call education and culture is for the most part nothing but the substitution of reading for experience, of literature for life, of the obsolete fictitious for the contemporary real.*

**- George Bernard Shaw**

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