4.2 Derivative Rules Backwards

FIND THE FOLLOWING INDEFINITE INTEGRALS.

857. $\int (x^3 + 2)\ dx$

858. $\int (x^2 - 2x + 3)\ dx$

859. $\int (x^{3/2} + 2x + 1)\ dx$

860. $\int \left(\sqrt{x} + \dfrac{1}{2\sqrt{x}}\right)\ dx$

861. $\int \sqrt[3]{x^2}\ dx$

862. $\int \dfrac{1}{x^3}\ dx$

863. $\int \dfrac{x^2 + 1}{x^2}\ dx$

864. $\int x^2\sqrt{x}\ dx$

865. $\int 3\ dx$

866. $\int (x^2 - \sin x)\ dx$

867. $\int (1 - \csc x \cot x)\ dx$

868. $\int (\sec^2\theta - \sin\theta)\ d\theta$

869. $\int \sec\theta(\tan\theta - \sec\theta)\ d\theta$

870. $\int \dfrac{8}{x^{3/5}}\ dx$

871. $\int \dfrac{-3x}{\sqrt[3]{x^4}}\ dx$

872. $\int 7x^3(3x^4 - 2x)\ dx$

873. $\int \dfrac{7\sqrt{x} - 3x^2 - 3}{4\sqrt{x}}\ dx$

874. $\int e^x\ dx$

875. $\int 2^x \ln 2\ dx$

876. $\int 5e^x\ dx$

877. $\int \dfrac{1}{x^2 + 1}\ dx$

878. $\int \dfrac{3}{\sqrt{1 - x^2}}\ dx$

The scientist does not study nature because it is useful; he studies it because he delights in it, and he delights in it because it is beautiful. If nature were not beautiful, it would not be worth knowing, and if nature were not worth knowing, life would not be worth living. Of course I do not here speak of that beauty that strikes the senses, the beauty of qualities and appearances; not that I undervalue such beauty, far from it, but it has nothing to do with science; I mean that profounder beauty which comes from the harmonious order of the parts, and which a pure intelligence can grasp. —*Henri Poincaré*

4.3 The Method of Substitution

FIND THE FOLLOWING INDEFINITE INTEGRALS.

879. $\int -2x\sqrt{9-x^2}\ dx$

880. $\int x(4x^2+3)^3\ dx$

881. $\int \frac{x^2}{(1+x^3)^2}\ dx$

882. $\int \left(x^2+\frac{1}{9x^2}\right)\ dx$

883. $\int \frac{x^2+3x+7}{\sqrt{x}}\ dx$

884. $\int \left(\frac{t^3}{3}+\frac{1}{4t^2}\right)\ dt$

885. $\int \sin 2x\ dx$

886. $\int \cos 6x\ dx$

887. $\int \tan^4\theta\sec^2\theta\ d\theta$

888. $\int \frac{\sin\theta}{\cos^2\theta}\ d\theta$

889. $\int \cos\frac{\theta}{2}\ d\theta$

890. $\int x\sqrt{2x+1}\ dx$

891. $\int x^2\sqrt{1-x}\ dx$

892. $\int \sqrt{4x-3}\ dx$

893. $\int x^4\sqrt{3x^5-4}\ dx$

894. $\int \frac{3x^6}{(2x^7-1)^5}\ dx$

895. $\int 4x\sqrt{5x-2}\ dx$

896. $\int 12x^2\sin(4x^3)\ dx$

897. $\int 4e^x\cos(4e^x)\ dx$

898. $\int 3^{3t}\ln 3\ dt$

899. $\int 6^{2x^2-3}x\ln 6\ dx$

900. $\int 2^{5x}\ dx$

901. $\int \frac{1}{\sqrt{5x+4}}\ dx$

902. $\int 3y\sqrt{7-3y^2}\ dy$

903. $\int \cos(3z+4)\ dz$

904. $\int \frac{1}{t^2}e^{1/t}\ dt$

905. $\int \sec(x+\frac{\pi}{2})\tan(x+\frac{\pi}{2})\ dx$

906. $\int -\csc^2\theta\sqrt{\cot\theta}\ d\theta$

907. $\int \frac{x}{x^2+4}\ dx$

908. $\int \frac{1}{\sqrt{1-4x^2}}\ dx$

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

910. $\int \frac{1}{x}\ dx$

The science of pure mathematics... may claim to be the most original creation of the human spirit. —*Alfred North Whitehead*