4.6 The MVT and the FTC

FIND y', THE DERIVATIVE OF THE FUNCTION y, FOR EACH OF THE FOLLOWING USING THE FUNDAMENTAL THEOREM OF CALCULUS.

924. $y = \displaystyle\int_0^x (t+2)\ dt$

925. $y = \displaystyle\int_8^x \sqrt[3]{t}\ dt$

926. $y = \displaystyle\int_{\pi/4}^x \sec^2 t\ dt$

927. $y = \displaystyle\int_{-2}^x (t^2 - 2t)\ dt$

928. $y = \displaystyle\int_{-1}^x \sqrt{t^4+1}\ dt$

929. $y = \displaystyle\int_0^x \tan^4 t\ dt$

930. $y = \displaystyle\int_0^x t\cos t\ dt$

931. $y = \displaystyle\int_1^x \frac{t^2}{1+t^2}\ dt$

932. $y = \displaystyle\int_x^{x+2} (4t+1)\ dt$

933. $y = \displaystyle\int_0^{\sin x} \sqrt{t}\ dt$

934. $y = \displaystyle\int_0^{x^3} \sin(t^2)\ dt$

935. $y = \displaystyle\int_0^{3x} \sqrt{1+t^3}\ dt$

FIND THE AVERAGE VALUE OF EACH OF THE FOLLOWING FUNCTIONS ON THE GIVEN INTERVAL.

936. $f(x) = x - 2\sqrt{x};\ \ [0,2]$

937. $f(x) = \dfrac{9}{x^3};\ \ [1,3]$

938. $f(x) = 2\sec^2 x;\ \ [-\frac{\pi}{4}, \frac{\pi}{4}]$

939. $f(x) = \cos x;\ \ [-\frac{\pi}{3}, \frac{\pi}{3}]$

FIND EXACT VALUES FOR EACH OF THE FOLLOWING DEFINITE INTEGRALS.

940. $\displaystyle\int_0^1 (x^2 + \sqrt{x})\ dx$

941. $\displaystyle\int_0^{\pi/3} 2\sec^2 x\ dx$

942. $\displaystyle\int_{-\pi/2}^{\pi/2} (8y^2 + \sin y)\ dy$

943. $\displaystyle\int_4^9 \frac{1-\sqrt{u}}{\sqrt{u}}\ du$

944. $\displaystyle\int_2^7 3\ dx$

945. $\displaystyle\int_{-1}^8 (x^{1/3} - x)\ dx$

946. $\displaystyle\int_{-1}^1 (t^2 - 2)\ dt$

947. $\displaystyle\int_0^3 (3x^2 + x - 2)\ dx$

948. $\displaystyle\int_1^2 \left(\frac{3}{x^2} - 1\right)\ dx$

949. $\displaystyle\int_{-2}^{-1} \left(u - \frac{1}{u^2}\right)\ du$

950. $\displaystyle\int_{-\pi/3}^{\pi/3} 4\sec\theta\tan\theta\ d\theta$

951. $\displaystyle\int_0^2 3^x \ln 3\ dx$

952. $\displaystyle\int_0^{\ln 5} e^x\ dx$

953. $\displaystyle\int_{-1}^1 \frac{1}{\sqrt{1-x^2}}\ dx$