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1. [illegible]

(a) [illegible] $y = \sqrt{5x^2 - \sin x}$.

(b) [illegible] $\displaystyle\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx$.

(c) [illegible] $\displaystyle\int_0^{\ln\sqrt{3}} \frac{e^x}{1+e^{2x}}\,dx$.

(d) [illegible] $\displaystyle\int_1^5 \ln\left(\frac{x}{x+1}\right)dx$ [illegible] $n = 4$

[illegible]

(e) [illegible] $\displaystyle\lim_{x\to\infty} 2x\sinh\left(\frac{3}{x}\right)$.

Solution:

(a) $\displaystyle\frac{dy}{dx} = \frac{10x - \cos x}{2\sqrt{5x^2 - \sin x}}$.

(b) [illegible] $u = \arcsin(x)$. [illegible] $du = \frac{1}{\sqrt{1-x^2}}\,dx$

$$\int \frac{\arcsin(x)}{\sqrt{1-x^2}}\,dx = \int u\,du = \frac{1}{2}u^2 + C = \frac{1}{2}(\arcsin(x))^2 + C$$

(c) [illegible] $u = e^x$. [illegible] $du = e^x\,dx$, [illegible] $u = e^{\ln\sqrt{3}}$

$$\lim_{x \to 1} 2x \sinh\left(\frac{3}{x}\right) = \lim_{x \to 1} \frac{2\sinh\left(\frac{3}{x}\right)}{\frac{1}{x}}$$
$$\overset{H}{=} \lim_{x \to 1} \frac{\cosh\left(\frac{3}{x}\right)\left(\frac{-6}{x^2}\right)}{\frac{-1}{x^2}}$$
$$= \lim_{x \to 1} 6\cosh\left(\frac{3}{x}\right)$$
$$= 6:$$

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f (x), x = a

f (x) [−1; 1]

$$f(x) = \begin{cases} 2\sin^{-1}(x) & \text{if } x < \frac{1}{2} \\ c & \text{if } x = \frac{1}{2} \\ \cos^{-1}(x) & \text{if } x > \frac{1}{2}: \end{cases}$$

c f $x = \frac{1}{2}$

$h'(x) = \frac{1}{\sqrt{x}} - \frac{1}{4}$. $h'(x)$ $h(x)$ $h'(x) = 0$

$x = 16$, $x = 16$ $h(x)$: $h'(x) > 0$ $0 < x < 16$
$h'(x) < 0$ $x > 16$, $h(x)$ $x = 16$,

$r'(x) = 2\sqrt{\tan(x)} - \frac{1}{4}\tan(x)\sec^2(x)$:

$$s(x) = \frac{e^{2x}}{3 - e^{2x}}.$$

$s'(1)$: e)

$s(x)$. $s^{-1}(x)$:
$s(x)$ $s(x)$:

$s(x)$:

$s(x)$:

Solution:

$$s(x) = \frac{e^{2x}}{3 - e^{2x}} \cdot e^{-}$$

$\frac{1}{1}$

$$\frac{d}{dt} = \frac{\cos^2(\ )}{9}\frac{dx}{dt}$$
$$= \frac{(9=15)^2}{9} \cdot 3$$
$$= \frac{3}{25}$$:

cos