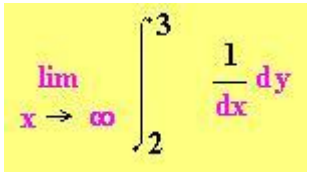

DIFFERENTIATION RULES FOR SOME TRANSCENDENTAL FUNCTIONS

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Problem 1:

For $f(x) = 7x\tan x$, find $f'(x)$.

Problem 2:

Find the derivative of $g(t) = t^2 - t\sin t$.

Problem 3:

Use the *Quotient Rule* to differentiate $y = \dfrac{1 - \csc x}{2x - 1}$.

Problem 4:

Differentiate $y = \dfrac{1}{\cos x \cot x}$ using the *Quotient Rule* and the *Product Rule*.

Problem 5:

Use the *Quotient Rule* to differentiate $f(x) = \dfrac{1 + \sec x}{1 - \sec x}$.

Problem 6:

Differentiate $f(x) = x \ln x$

Problem 7:

Differentiate $f(x) = \dfrac{\ln x}{x}$

Problem 8:

Differentiate $f(x) = x^2 e^x$

Problem 9:

Differentiate $f(x) = e^x(\sin x + \cos x)$

Problem 10:

Differentiate $f(x)=\frac{7x}{e^x}$

Problem 11:

Differentiate $f(x)=\frac{2(3^x)}{x}$

Problem 12:

Differentiate $f(x)=\tan x \log_3 x$

Problem 13:

Find the slope-intercept equation of the line tangent to the graph of $f(x)=3x+\sin x$ at the point $(\pi,3\pi)$.

Problem 14:

Determine ALL x-coordinates at which the graph of the function $f(x)=2\cos x+x\sqrt{2}$ has a horizontal tangent line.

SOLUTIONS

You can find detailed solutions below the link for this problem set!

1. $f'(x)=7\tan x+7x\sec^2 x$	2. $g'(t)=2t-\sin t-t\cos t$
3. $\frac{dy}{dx}=\frac{\csc x(2x\cot x-\cot x+2)-2}{(2x-1)^2}$	4. Quotient Rule $\frac{dy}{dx}=\frac{\sin x\cot x+\cos x\csc^2 x}{\cos^2 x\cot^2 x}$ Product Rule $\frac{dy}{dx}=\sec x\tan^2 x+\sec^3 x$
5. $\frac{dy}{dx}=\frac{2\sec x\tan x}{(1-\sec x)^2}$	6. $f'(x)=\ln x+1$
7. $f'(x)=\frac{1-\ln x}{x^2}$	8. $f'(x)=2xe^x+x^2e^x$

9. $f'(x) = 2e^x \cos x$	10. $f'(x) = \frac{7 - 7x}{e^x}$
11. $f'(x) = \frac{2 \ln 3(3^x)x - 2(3^x)}{x^2}$	12. $f'(x) = \sec^2 x \log_3 x + \frac{\tan x}{x \ln 3}$
13. $y = 2x + \pi$.	14. $\frac{\pi}{4} + 2\pi k$ and $\frac{3\pi}{4} + 2\pi k$, where k is any integer.