

6.2	Derivative of x^n	$f(x) = x^n \Rightarrow f'(x) = nx^{n-1}$
	Derivative of $\sin x$	$f(x) = \sin x \Rightarrow f'(x) = \cos x$
	Derivative of $\cos x$	$f(x) = \cos x \Rightarrow f'(x) = -\sin x$
	Derivative of $\tan x$	$f(x) = \tan x \Rightarrow f'(x) = \frac{1}{\cos^2 x}$
	Derivative of e^x	$f(x) = e^x \Rightarrow f'(x) = e^x$
	Derivative of $\ln x$	$f(x) = \ln x \Rightarrow f'(x) = \frac{1}{x}$
	Chain rule	$y = g(u), u = f(x) \Rightarrow \frac{dy}{dx} = \frac{dy}{du} \times \frac{du}{dx}$
	Product rule	$y = uv \Rightarrow \frac{dy}{dx} = u \frac{dv}{dx} + v \frac{du}{dx}$
	Quotient rule	$y = \frac{u}{v} \Rightarrow \frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$

1.) Let $f(x) = 5\cos(3x - 1)\ln(x)$. Find $f'(x)$.

[3 marks]

[SL non-calc]

2.) Given that $y = e^{-x^2}$ find

[4 marks]

[SL non-calc]

(a) $\frac{d^2y}{dx^2}$;

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3.) Evaluate $f(x) = 5 \cos (2x - \pi)$ for $f'(\pi)$.

[4 marks]

[SL non-calc]

4.) Find the first four derivatives of $f(x) = \ln 2x$

[4 marks]

[SL non-calc]

5.) Given $f(x) = \sin 3x$ and $g(x) = e^{3x}$,

[6 marks]

[SL non-calc]

a.) Find $f'(x)$

b.) Find $g'(x)$

c.) Find $h'(x)$ if $h(x) = f(x) * g(x)$

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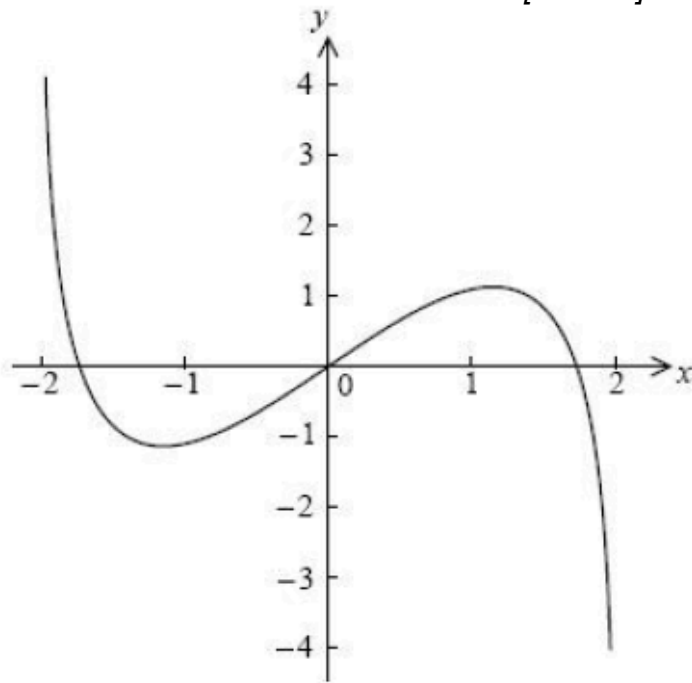
6.) $\lim_{x \rightarrow 0^-} \frac{8}{x}$ [1 mark]
[SL non-calc]

7.) $\lim_{x \rightarrow -\infty} \frac{10 - \sin x}{x + 3}$ [1 mark]
[SL non-calc]

Answer: _____

Answer: _____

- 15.) Consider $f(x) = x \ln(4 - x^2)$, for $-2 < x < 2$. The graph of f is given below.
[SL calc]



- (a) Let P and Q be points on the curve of f where the tangent to the graph of f is parallel to the x -axis.
- Find the x -coordinate of P and of Q.
 - Label points P and Q on the curve of f .

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8.) Let $r(x) = x^3 - \frac{x^2}{2} - 4x + 1$.

[SL non-calc]

- i) Find the minimum and maximum x-coordinates via factoring $r'(x)$. [2 marks]
ii) Determine which of these x-coordinates is the minimum. [2 marks]

16.) For the function $f(x) = x^2 - 12x + 17$, find the value(s) of "x" where the tangent line is horizontal. [2 marks] [SL non-calc]

17.) For $f(x)$, a certain value for "x" yields $f'(x) = 0$. What does this say about the tangent line for this value of "x." [2 marks] [SL non-calc]

A: The tangent line is increasing.

B: The tangent line is decreasing.

C: The tangent line is horizontal.

D: The tangent line is vertical.

Answer key (show all calculations for full credit)

1.) $-15 \cdot \ln(x) \sin(3 \cdot x - 1) + \frac{5 \cdot \cos(3 \cdot x - 1)}{x}$

2.) $4 \cdot x^2 e^{-x^2} - 2 \cdot e^{-x^2}$

3.) $f'(\pi) = 0$

4.) $f'(x) = 1/x$, $f''(x) = -1/x^2$, and so on...

5.) c) $3 \cdot e^{(3 \cdot x)} \sin(3 \cdot x) + 3 \cdot e^{(3 \cdot x)} \cos(3 \cdot x)$

6-15.) tutorials

15.) $x = 4/3$, $(-1, 3.5)$

16.) $f'(6) = 0$

17.) tutorials