

Differentiating e^x and $\ln(x)$

IB SL/HL

1. Differentiating $y=e^x$.

- a) Draw a graph of $y=e^x$ on your graphic calculator.
- b) Fill in the table below that shows the value of $y=e^x$ and the gradient of the curve at each of the following points.

x	-2	-1	0	1	2
y					
Gradient					

- c) Can you draw any conclusions using the table above for $y=e^x$, and the differential of the function $y=e^x$?
- d) Try repeating the exercise above with the function $y = e^{2x}$.

x	-2	-1	0	1	2
y					
Gradient					

- e) Now try with $y=e^{-2x}$.

x	-2	-1	0	1	2
y					
Gradient					

- f) Differentiate each of the following using the chain rule.
- (i) $y=e^{2x}$.
- (ii) $y=e^{-5x}$.

2. Differentiating $y=\ln(x)$.

- a) Draw a graph of $y=\ln(x)$ on your graphic calculator.
- b) Fill in the table below that shows the value of $y=\ln(x)$ and the gradient of the curve at each of the following points.

x	0.5	1	2	3	4	5
y						
Gradient						

- c) Can you draw any conclusions using the table above for $y=e^x$, and the differential of the function $y=\ln(x)$?
- d) Try repeating the exercise above with the function $y=\ln(2x)$.

x	0.5	1	2	3	4	5
y						
Gradient						

- e) Differentiate each of the following using the chain rule.

(i) $y=\ln(3x)$

(ii) $y=\ln(1/2x)$

(iii) $y=3\ln(3x)+2e^{4x}$.