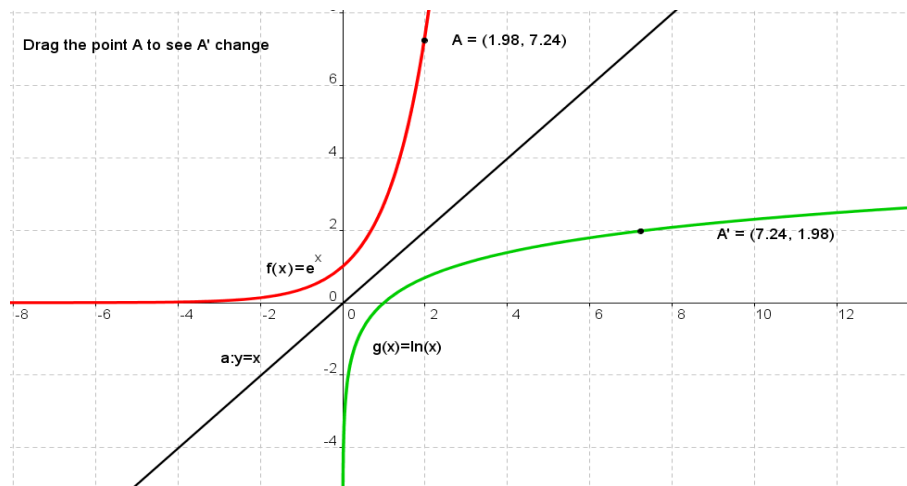# Student Activity: To investigate $f(x) = e^x$ and $g(x) = \ln(x)$

Use in connection with the interactive file, 'e^x and ln(x)', on the student's CD.

Note Ln(x) = log$_e$x.

1. Use a calculator to find an approximate value for e correct to 3 decimal places.

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2.

    a. Complete the following table giving answers correct to 3 decimal places.

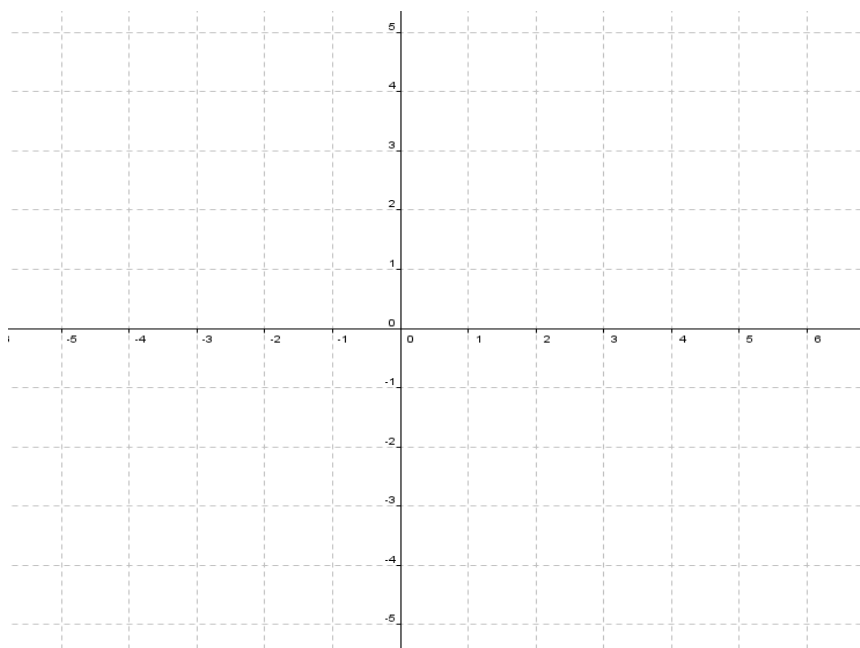| x	$y = e^x$	$\ln(y)$
3		
2		
1.5		
1		
0.5		
0		
-0.5		
-1		
-1.5		

    b. What is the relationship between $\ln(y)$ and x in the above table?

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_____

c. On the same axis and scale draw the graphs of f(x) =e^x and f^{-1}(x) using the data provided in the table above.

d. Using the interactive file complete the following table for any 4 values of A and the corresponding values of A' and state what pattern you notice.

A (x, y)	A'(x, y)

_____

e. What do you notice about the shapes of these graphs in relation to each other?

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f. Given e$^{1.34}$ = 3.82, what will ln(3.82) equal?

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g. Given ln(0.33) = −1.1, what is e e$^{-1.1}$?

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h. What line is e^x reflected in to give ln(x)?

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i. What conclusion have you arrived at with regard to the relationship between the function e^x and ln(x)?

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