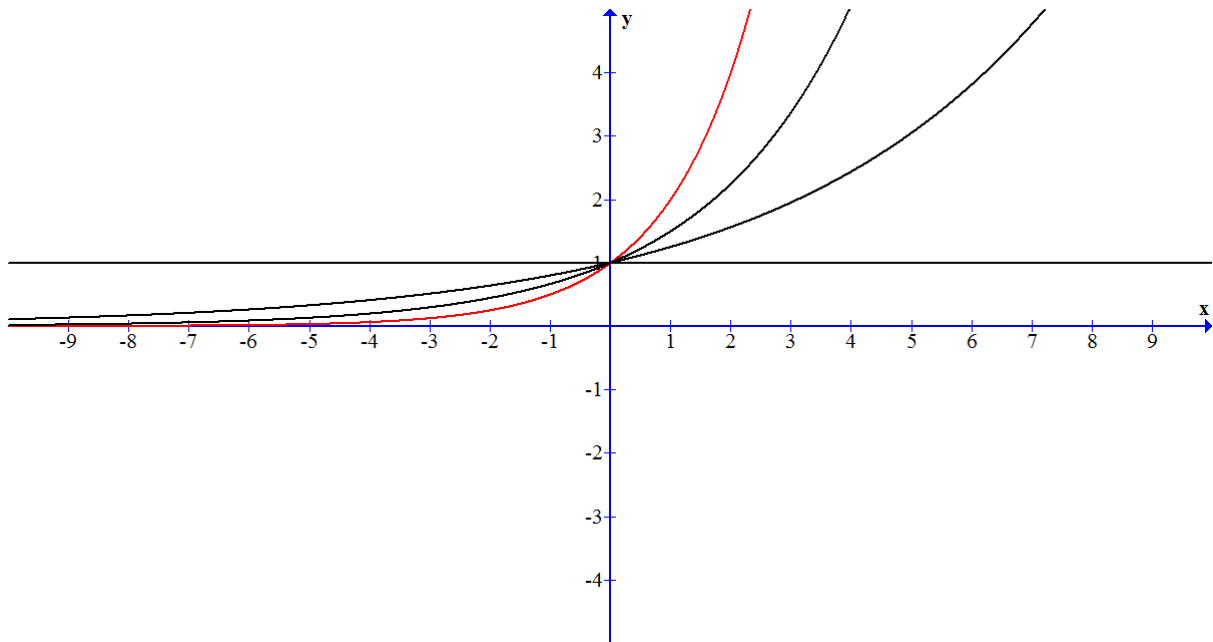


## Exponential Functions (2 pages; 2/6/23)

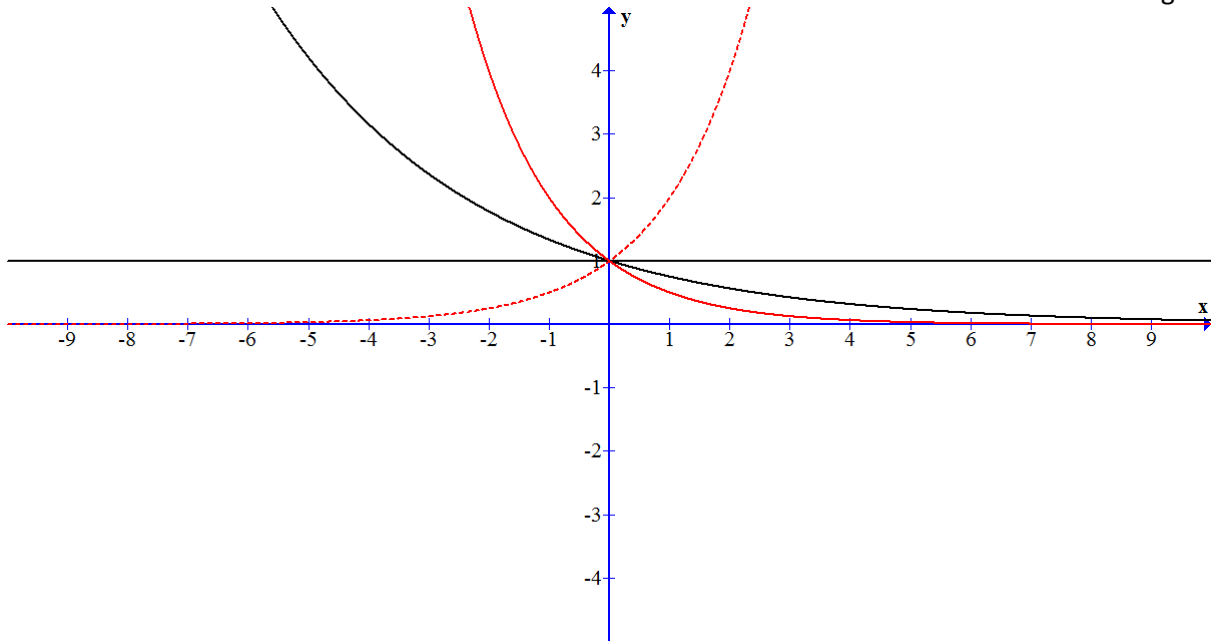
Connection between  $y = 2^x$  and  $y = 2^{-x}$

(i) Graphs of  $y = 2^x$  (red),  $y = 1.5^x$ ,  $y = 1.25^x$  and  $y = 1^x$ :



(ii) The pattern continues for numbers below 1.

Graphs of  $y = 2^x$  (dotted red),  $y = 1^x$ ,  $y = 0.75^x$  and  $y = 0.5^x$  (red):



$$(iii) \quad 0.5^x = \left(\frac{1}{2}\right)^x = (2^{-1})^x = 2^{-x}$$

and  $y = 2^{-x}$  is the reflection of  $y = 2^x$  in the y axis (as  $x$  is being replaced by  $-x$ )