

## Exercise 5

- (a) Write an equation that defines the exponential function with base  $b > 0$ .
- (b) What is the domain of this function?
- (c) If  $b \neq 1$ , what is the range of this function?
- (d) Sketch the general shape of the graph of the exponential function for each of the following cases.
- (i)  $b > 1$
  - (ii)  $b = 1$
  - (iii)  $0 < b < 1$

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### Solution

The exponential function with  $b > 0$  is

$$y = b^x.$$

The domain of this function is  $\{x \mid -\infty < x < \infty\}$ . If  $b \neq 1$ , then the range of this function is  $(0, \infty)$  as the first and third graphs below indicate.



