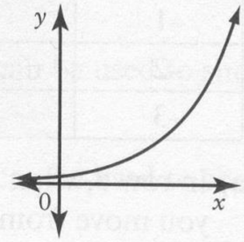
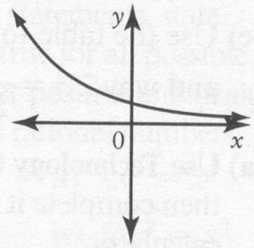
KEY CONCEPTS

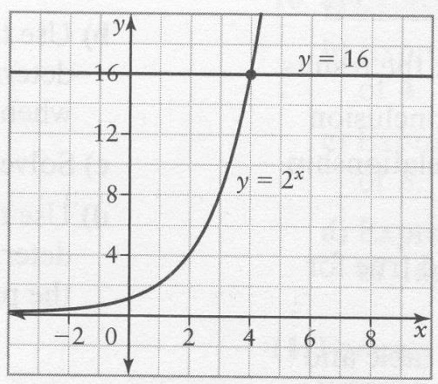
- A function of the form $y = ab^x$ is an exponential function for $b > 0$, $b \neq 1$.
- The graph of $y = ab^x$ represents exponential growth and is increasing if $a > 0$ and $b > 1$. The domain is $\{x \in \mathbb{R}\}$, the range is $\{y \in \mathbb{R}, y > 0\}$, the y-intercept is a, and the horizontal asymptote is $y = 0$.



- The graph of $y = ab^x$ represents exponential decay and is decreasing if $a > 0$ and $0 < b < 1$. The domain is $\{x \in \mathbb{R}\}$, the range is $\{y \in \mathbb{R}, y > 0\}$, the y-intercept is a, and the horizontal asymptote is $y = 0$.



- If you are given enough information about the graph or the properties of an exponential function, it is possible to write an equation or sketch a graph to model the function.
- Equations in one variable, such as $2^x = 16$, can be solved by finding the point of intersection of the corresponding graphs $y = 2^x$ and $y = 16$. The solution to the equation will be the x-coordinate of the point of intersection.



- Exponential equations in one variable can be solved graphically using technology.
- Many real-world applications can be modelled using an exponential function. Some examples are population growth, compound interest, and depreciation.