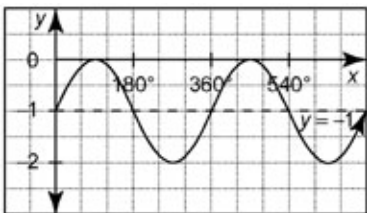
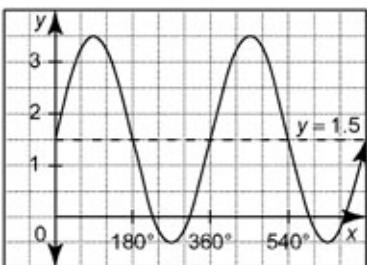
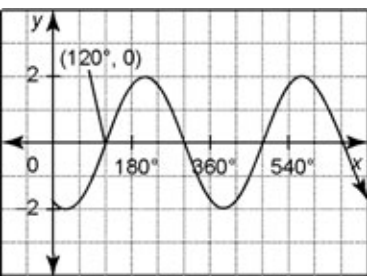


Section 5.4 Investigate Transformations of Sine Curves

- Sketch a graph of each function for $0^\circ \leq x \leq 360^\circ$. Determine the period, amplitude, domain, and range.
 - $y = \frac{4}{5} \sin x$
 - $y = -3 \sin x$
- Compare the graphs of each pair of functions for $0^\circ \leq x \leq 360^\circ$. Determine the period, amplitude, domain, range, phase shift, and the equation of the horizontal axis.
 - $y = \sin x + 3.8$ and $y = \sin x - 3.8$
 - $y = \sin(x - 45^\circ)$ and $y = \sin(x + 135^\circ)$
- Write an equation for each sine function.
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- Draw a sketch of $y = 3 \sin(x + 270^\circ)$ for one period.
 - Locate all the points where $y = -3$ and give the values of x .
 - Locate all the points where $y = 0$ and give the values of x .
- Graph one cycle of each function. Label the x -intercepts, the maximum points, the minimum points, and the equation of the horizontal axis. Write the domain and range of the cycle.
 - $y = -2 \sin x$
 - $y = 0.5 \sin x + 5$
- For each function, find the coordinates of the maximum and minimum points for $0^\circ \leq x \leq 720^\circ$.
 - $y = \sin x + 10$
 - $y = -\sin x$
- Write an equation for each sine function. Indicate the intervals in which the function is increasing and decreasing over one period.
 - amplitude = 2, horizontal axis along $y = 2$
 - amplitude = 1, horizontal axis along the x -axis, phase shift of 90° to the left
- A clock face is attached to a tower so that its centre is 60 m above the ground. The hour hand is 2 m in length and starts out pointing at 3 on the clock face.
 - Sketch a graph that represents the height of the tip of the hour hand relative to the angle it forms with the horizontal as it rotates for 1 day.
 - Determine an equation that represents the height of the tip of the hour hand with respect to the ground.
 - How would the graph and equation change if the hour hand were 3 m in length?
 - How would the graph and equation change if the hour hand had started out pointing at the 9 on the clock face?