

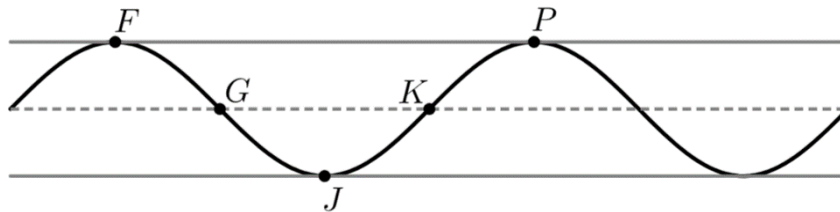
**Note: Figure NOT drawn to scale**

1. The blades of a boat motor rotate in a clockwise direction and complete 50 rotations every second. Point B is on the tip of one of the blades and is located directly above the center of the motor at time  $t = 0$  seconds, as indicated in the figure. Point B is 8 inches from the center of the motor. The center of the motor is 18 inches below the water line. As the blades of the motor rotate at a constant speed, the distance between B and the water line periodically increases and decreases.

The periodic function  $h$  models the distance between point B and the water line, in inches, as a function of time  $t$  in seconds.

(A) The graph of  $h$  and its dashed midline for two full cycles is shown. Five points,  $F$ ,  $G$ ,  $J$ ,  $K$ , and  $P$  are labeled on the graph. No scale is indicated, and no axes are presented.

Determine possible coordinates  $(t, h(t))$  for the five points:  $F$ ,  $G$ ,  $J$ ,  $K$ , and  $P$ .



(B) Refer to the graph of  $h$  in part (A). The  $t$ -coordinate of  $G$  is  $t_1$ , and the  $t$ -coordinate of  $J$  is  $t_2$ .

(j) On the interval  $(t_1, t_2)$ , which of the following is true about  $h$ ?

- $h$  is positive and increasing.
- $h$  is positive and decreasing.
- $h$  is negative and increasing.
- $h$  is negative and decreasing.

(ii) Describe how the rate of change of  $h$  is changing over the interval  $(t_1, t_2)$ .