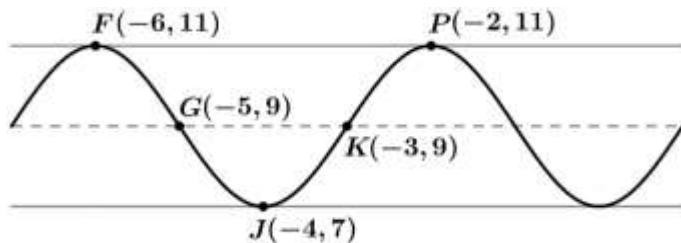


## Worksheet A: Topic 1.1

Name: \_\_\_\_\_

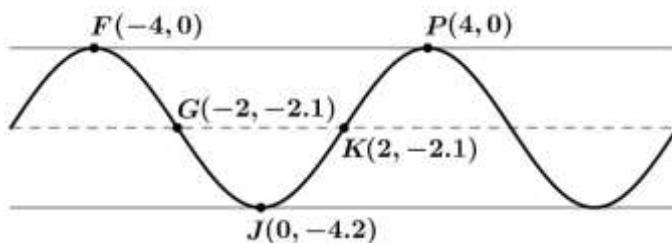


## AP Precalculus -- Change in Tandem



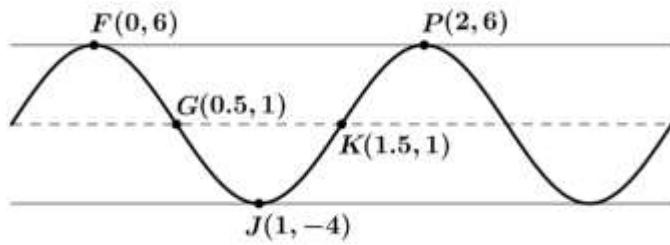
1. The graph of  $h(t)$  and its dashed midline for two full cycles is shown. Five points,  $F, G, J, K$ , and  $P$  are labeled on the graph. No scale is indicated, and no axes are presented. The  $t$ -coordinate of  $G$  is  $t_1$ , and the  $t$ -coordinate of  $J$  is  $t_2$ .

- (i) On the interval  $(t_1, t_2)$ , which of the following is true about  $h$ ?
- a.  $h$  is positive and increasing.
  - b.  $h$  is positive and decreasing.
  - c.  $h$  is negative and increasing.
  - d.  $h$  is negative and decreasing.
- (ii) Describe how the rate of change of  $h$  is changing on the interval  $(t_1, t_2)$ .



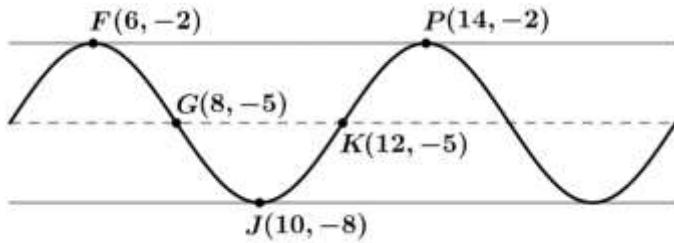
2. The graph of  $h(t)$  and its dashed midline for two full cycles is shown. Five points,  $F, G, J, K$ , and  $P$  are labeled on the graph. No scale is indicated, and no axes are presented. The  $t$ -coordinate of  $K$  is  $t_1$ , and the  $t$ -coordinate of  $P$  is  $t_2$ .

- (i) On the interval  $(t_1, t_2)$ , which of the following is true about  $h$ ?
- a.  $h$  is positive and increasing.
  - b.  $h$  is positive and decreasing.
  - c.  $h$  is negative and increasing.
  - d.  $h$  is negative and decreasing.
- (ii) Describe how the rate of change of  $h$  is changing on the interval  $(t_1, t_2)$ .



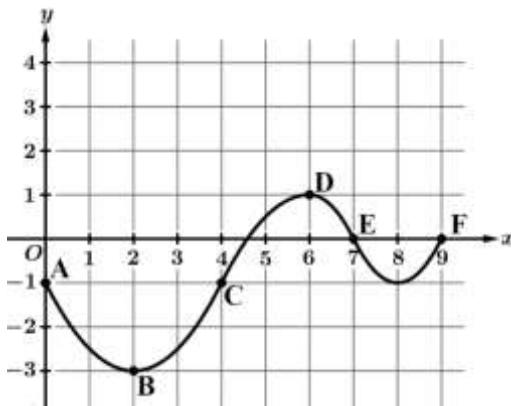
3. The graph of  $h(t)$  and its dashed midline for two full cycles is shown. Five points,  $F$ ,  $G$ ,  $J$ ,  $K$ , and  $P$  are labeled on the graph. No scale is indicated, and no axes are presented. The  $t$ -coordinate of  $F$  is  $t_1$ , and the  $t$ -coordinate of  $G$  is  $t_2$ .

- (i) On the interval  $(t_1, t_2)$ , which of the following is true about  $h$ ?
  - a.  $h$  is positive and increasing.
  - b.  $h$  is positive and decreasing.
  - c.  $h$  is negative and increasing.
  - d.  $h$  is negative and decreasing.
- (ii) Describe how the rate of change of  $h$  is changing on the interval  $(t_1, t_2)$ .



4. The graph of  $h(t)$  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. The  $t$ -coordinate of  $J$  is  $t_1$ , and the  $t$ -coordinate of  $K$  is  $t_2$ .

- (i) On the interval  $(t_1, t_2)$ , which of the following is true about  $h$ ?
  - a.  $h$  is positive and increasing.
  - b.  $h$  is positive and decreasing.
  - c.  $h$  is negative and increasing.
  - d.  $h$  is negative and decreasing.
- (ii) Describe how the rate of change of  $h$  is changing on the interval  $(t_1, t_2)$ .



Graph of  $f$

The figure shows the graph of the function  $f$  for the interval  $0 \leq x \leq 9$ , as well as the six labeled points: A, B, C, D, E, and F. Use the graph of  $f$  for the following examples.

5. On which of the following intervals is  $f$  negative and increasing?

- (A) the interval from A to B
- (B) the interval from B to C
- (C) the interval from C to D
- (D) the interval from E to F

6. Which of the following statements about the rate of change of  $f$  is true?

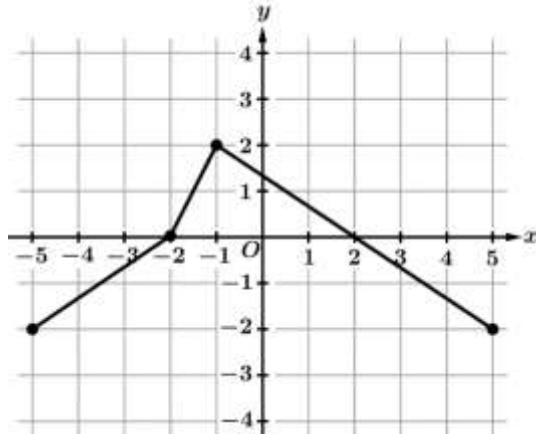
- (A) The rate of change of  $f$  is negative on the interval from B to C.
- (B) The rate of change of  $f$  is negative on the interval from C to D.
- (C) The rate of change of  $f$  is negative on the interval from D to E.
- (D) The rate of change of  $f$  is negative on the interval from E to F.

7. Which of the following statements about the rate of change of  $f$  is true?

- (A) The rate of change of  $f$  is decreasing on the interval from A to B.
- (B) The rate of change of  $f$  is decreasing on the interval from B to C.
- (C) The rate of change of  $f$  is increasing on the interval from C to D.
- (D) The rate of change of  $f$  is increasing on the interval from E to F.

8. On which of the following intervals is  $f$  decreasing and the graph of  $f$  concave up?

- (A) the interval from A to B
- (B) the interval from B to C
- (C) the interval from C to D
- (D) the interval from E to F

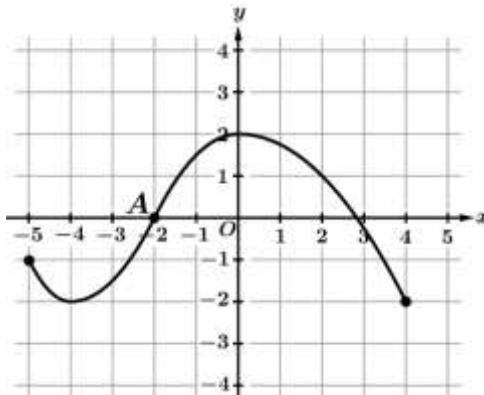


Graph of  $h$

The figure shows the graph of the function  $h$  on the interval  $-5 \leq x \leq 5$ .

9. On what intervals is  $h$  increasing?

10. On what intervals is  $h$  both positive and decreasing?



Graph of  $g$

The figure shows the graph of the function  $g$  on the interval  $-5 \leq x \leq 4$ . Point A is located at  $(-2, 0)$  and is the only point where the graph of  $g$  changes concavity.

11. On what intervals is the rate of change of  $g$  negative?

12. On what intervals is the rate of change of  $g$  positive and decreasing?