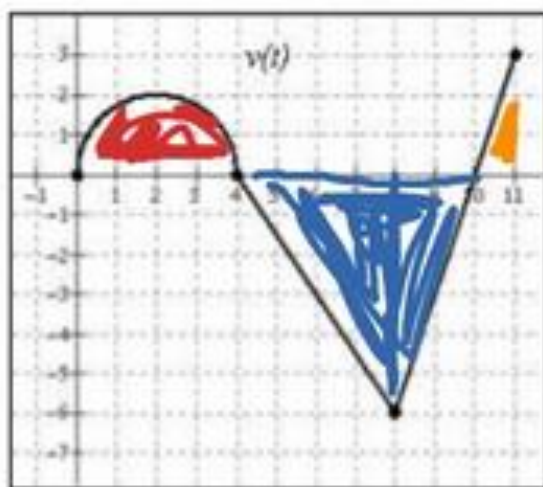


**Worksheet 5. Sample Practice Problems for the Topic of Motion (Part 2)**

**Example 1 (graphical).**

The graph to the right shows the velocity,  $v(t)$ , of a particle moving along the  $x$ -axis for  $0 \leq t \leq 11$ . It consists of a semicircle and two line segments. Use the graph and your knowledge of motion to answer the following questions.



1. At what time  $t$ ,  $0 \leq t \leq 11$ , is the speed of the particle the greatest?

Speed =  $|v(t)|$   $t = 8$

2. At which of the times,  $t = 2$ ,  $t = 6$  or  $t = 9$ , is the acceleration of the particle the greatest? Explain your answer.

$t = 9$

3. Over what time intervals is the particle moving to the left? Explain your answer.

$\leftarrow v (-) [4, 10]$

$$\frac{1}{2} \pi r^2 + \frac{1}{2} b \cdot h + \frac{1}{2} b h$$

$$\frac{1}{2} \pi \cdot 2^2 + \frac{1}{2} 6 \cdot 6 + \frac{1}{2} 1 \cdot 3$$

4. Over what time intervals is the speed of the particle decreasing? Explain your answer.

$v \uparrow a$  opp signs  $[2, 4] \cup [8, 10]$

$$2\pi + 18 + \frac{3}{2}$$

5. Find the total distance traveled by the particle over the time interval  $0 \leq t \leq 11$ .

$2\pi + \frac{39}{2}$