

Worksheet 8

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Are the following functions continuous on the indicated intervals?

1. The distance, s , a car has traveled on a trip is shown in the table as a function of the time, t , since the trip started. Find the average velocity between $t = 2$ and $t = 5$.

t (hours)	0	1	2	3	4	5
s (km)	0	45	135	220	300	400

4. Figure 2.6 shows a particle's distance from a point. What is the particle's average velocity from $t = 0$ to $t = 3$?

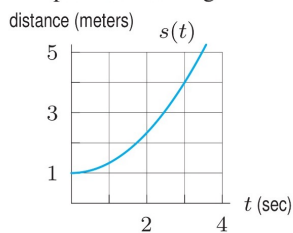


Figure 2.6

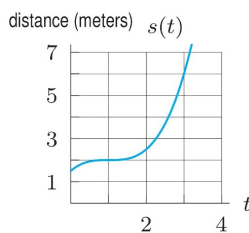


Figure 2.7

5. Figure 2.7 shows a particle's distance from a point. What is the particle's average velocity from $t = 1$ to $t = 3$?
6. At time t in seconds, a particle's distance $s(t)$, in micrometers (μm), from a point is given by $s(t) = e^t - 1$. What is the average velocity of the particle from $t = 2$ to $t = 4$?
7. At time t in seconds, a particle's distance $s(t)$, in centimeters, from a point is given by $s(t) = 4 + 3 \sin t$. What is the average velocity of the particle from $t = \pi/3$ to $t = 7\pi/3$?

Estimate the limits in Problems 14–17 by substituting smaller and smaller values of h . For trigonometric functions, use radians. Give answers to one decimal place.

14. $\lim_{h \rightarrow 0} \frac{(3+h)^3 - 27}{h}$ 15. $\lim_{h \rightarrow 0} \frac{\cos h - 1}{h}$
 16. $\lim_{h \rightarrow 0} \frac{7^h - 1}{h}$ 17. $\lim_{h \rightarrow 0} \frac{e^{1+h} - e}{h}$

18. Match the points labeled on the curve in Figure 2.8 with the given slopes.

Slope	Point
-3	
-1	
0	
1/2	
1	
2	

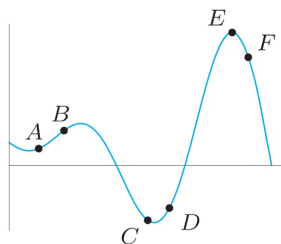


Figure 2.8

19. For the function shown in Figure 2.9, at what labeled points is the slope of the graph positive? Negative? At which labeled point does the graph have the greatest (i.e., most positive) slope? The least slope (i.e., negative and with the largest magnitude)?

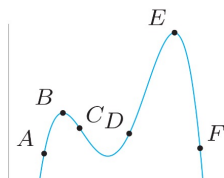


Figure 2.9

20. For the graph $y = f(x)$ in Figure 2.10, arrange the following numbers from smallest to largest:

- The slope of the graph at A .
- The slope of the graph at B .
- The slope of the graph at C .
- The slope of the line AB .
- The number 0.
- The number 1.

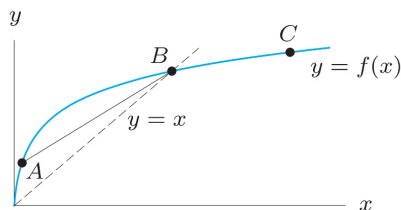


Figure 2.10