

Calculus AB

2-3a

Position

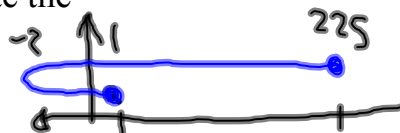
(Stewart Supplement)

Oct 27-8:17 AM

- 4) A particle moves according to a law of motion $s = f(t)$, $t \geq 0$, where t is measured in seconds and s is measured in feet.

$$f(t) = t^4 - 4t + 1$$

- a) Find the velocity at time t . $v(t) = f'(t) = 4t^3 - 4$
- b) What is the velocity after 3s? $v(3) = 4(3)^3 - 4 = 104 \text{ Ft/sec}$
- c) When is the particle at rest? $v(t) = 0$ $0 = 4t^3 - 4$ $0 = t^3 - 1$
 $t = 1 \text{ sec}$
- d) When is the particle moving in the positive direction? $t \geq 1 \text{ sec}$ because $v(3) > 0$
- e) Find the total distance traveled during the first 8 sec. $|s(1) - s(0)| + |s(8) - s(1)| =$
 $|(-2) - 1| + |225 - (-2)| = 3 + 227 = 230 \text{ Ft}$
- f) Draw a diagram to illustrate the motion of the particle.



Oct 27-8:18 AM

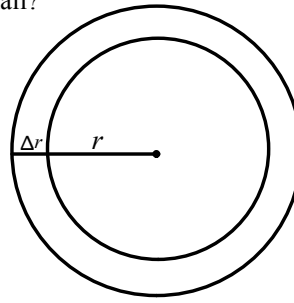
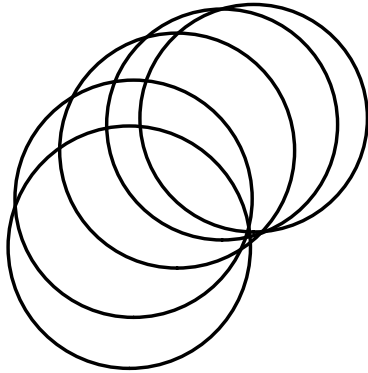
13) a) Find the average rate of change of the area of a circle with respect to its radius (at any r) as r changes from:

a) *i*) 2 to 3

ii) 2 to 2.5

b) Find the instantaneous rate of change when $r = 2$.

c) Show that the rate of change of the area of a circle with respect to its radius (any r) is equal to the circumference of the circle. Try to explain geometrically why this is true by drawing a circle whose radius is increased by an amount Δr . How can you approximate the resulting change in area ΔA if Δr is small?



Oct 27-8:22 AM

Assignment:

Handout (Pg. 166)

3, 7-10, 14, 15

18-21, 33, 35

Oct 27-8:37 AM