Watch. Practice. Understand. | Lesson 308

Calculus 5.4 Part III Finding Displacement and Distance

Watch the matching video: https://www.youtube.com/watch?v=MNK4S4SRER8

Practice focus: Displacement and distance

Original extra practice matched to the listed lesson topic.

Name: _____ Date: _____ Show your reasoning and check units.

01 A particle has velocity v(t)=2t-4 on [0,4]. Find displacement.

02 For the same particle, find total distance traveled.

03 If s(0)=3 for that particle, find s(t).

04 When is that particle moving in the negative direction, and when does it reverse?

Worked answers | Lesson 308

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01 A particle has velocity v(t)=2t-4 on [0,4]. Find displacement.

Integral of v is $[t^2-4t]_0^4=0$.

02 For the same particle, find total distance traveled.

Velocity changes sign at t=2. Integrate |v|: 4 units on [0,2] and 4 on [2,4], total 8.

03 If s(0)=3 for that particle, find s(t).

Integrating v gives $s=t^2-4t+C$; C=3, so $s(t)=t^2-4t+3$.

04 When is that particle moving in the negative direction, and when does it reverse?

v<0 on 0<=t<2; v>0 on 2<t<=4. It reverses direction at t=2.