

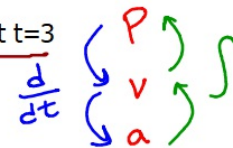
Calculus DS: tests are being passed back

worked out solutions are posted to Classroom (not weebly)
so check with a partner or with the solutions to help you study

Retake hw is posted to Powerschool

We'll learn more about "Finding C" in a few minutes

A car's acceleration after time $t=0$ can be modeled by the linear function $a(t) = 4t+2$ m/s². Find its position at $t=5$ if its position at $t=3$ is 2m and its velocity at $t=1$ is 6 m/s.



$$p(5) = ?$$

$$a(t) = 4t + 2$$

$$dt \left(\frac{dv}{dt} \right) = (4t+2) dt$$

$$\int dv = \int (4t+2) \cdot dt$$

$$v = 2t^2 + 2t + C$$

$$v(1) = 6$$

$$v(1) = 2(1)^2 + 2(1) + C = 6$$

$$4 + C = 6 \rightarrow C = 2$$

$$v(t) = 2t^2 + 2t + 2$$

$$\frac{dp}{dt} = 2t^2 + 2t + 2$$

$$\int dp = \int (2t^2 + 2t + 2) dt$$

$$p = \frac{2t^3}{3} + t^2 + 2t + C$$

$$p(t) = \frac{2}{3}t^3 + t^2 + 2t + C$$

$$p(3) = \frac{2}{3}(3)^3 + (3)^2 + 2(3) + C = 2$$

$$18 + 9 + 6 + C = 2$$

$$33 + C = 2 \rightarrow C = -31$$

$$p(3) = 2$$

$$p(t) = \frac{2}{3}t^3 + t^2 + 2t - 31$$

$$p(5) = \underline{\hspace{2cm}}$$

More on Finding C in the video posted to weebly/classroom

HW: p 252 #51-58

Time permitting: u-sub practice