

Example Student  
Resubmission of Example Quiz  
28 August 2019

Problem 1. I did not apply the chain rule correctly.  
I also used the wrong value for  $\sin(\frac{\pi}{6})$ , which is  $\frac{1}{2}$ , not  $\frac{\sqrt{3}}{2}$ .

$$\begin{aligned}\frac{d}{dt} \sqrt{\sin\left(\frac{\pi}{6}et\right)} &= \frac{d}{dt} \left(\sin\left(\frac{\pi}{6}et\right)\right)^{\frac{1}{2}} \\ &= \frac{1}{2} \left(\sin\left(\frac{\pi}{6}et\right)\right)^{-\frac{1}{2}} \left(\frac{\pi}{6}e^t \cos\left(\frac{\pi}{6}et\right)\right) \\ &= \frac{\pi}{12} e^t \cos\left(\frac{\pi}{6}et\right) \left(\sin\left(\frac{\pi}{6}et\right)\right)^{-\frac{1}{2}}\end{aligned}$$

$$\begin{aligned}\text{So, } \frac{d}{dt} \sqrt{\sin\left(\frac{\pi}{6}e^t\right)} \Big|_{t=0} &= \frac{\pi}{12} e^0 \cos\left(\frac{\pi}{6}e^0\right) \left(\sin\left(\frac{\pi}{6}e^0\right)\right)^{-\frac{1}{2}} \\ &= \frac{\pi}{12} \cos\left(\frac{\pi}{6}\right) \left(\sin\left(\frac{\pi}{6}\right)\right)^{-\frac{1}{2}} \\ &= \frac{\pi}{12} \left(\frac{\sqrt{3}}{2}\right) \left(\frac{1}{2}\right)^{-\frac{1}{2}} \\ &= \frac{\pi}{24} \sqrt{\frac{3}{2}} \\ &= \frac{\pi}{4\sqrt{6}}\end{aligned}$$

Name: Example Student

### Example Quiz

**Instructions.** You have 5 minutes to complete this quiz. You may use your calculator. You may not use any other materials (e.g., notes, homework, books).

Problem	Weight	Score
1	1	4
Total		4 / 10

**Problem 1.** Find  $\frac{d}{dt} \sqrt{\sin\left(\frac{\pi}{6}e^t\right)}$  at  $t = 0$ .

$$\begin{aligned}\frac{d}{dt} \sqrt{\sin\left(\frac{\pi}{6}e^t\right)} &= \frac{d}{dt} \left(\sin\left(\frac{\pi}{6}e^t\right)\right)^{\frac{1}{2}} \\ &= \frac{\frac{1}{2} \left(\sin\left(\frac{\pi}{6}e^t\right)\right)^{-\frac{1}{2}} \cdot \frac{\pi}{6} e^t}{\times} \\ &= \frac{\pi}{12} e^t \left(\sin\left(\frac{\pi}{6}e^t\right)\right)^{-\frac{1}{2}}\end{aligned}$$

$$\begin{aligned}\text{So, } \frac{d}{dt} \sqrt{\sin\left(\frac{\pi}{6}e^t\right)} \Big|_{t=0} &= \frac{\pi}{12} e^0 \left(\sin\left(\frac{\pi}{6}e^0\right)\right)^{-\frac{1}{2}} \\ &= \frac{\pi}{12} \left(\sin\left(\frac{\pi}{6}\right)\right)^{-\frac{1}{2}} \\ &= \frac{\pi}{12} \left(\frac{\sqrt{3}}{2}\right)^{-\frac{1}{2}} \times\end{aligned}$$