

Here are some more practice problems. Try to find the answers by yourselves and then check if you're right.

1 Problems:

1. How long will it take for a radioactive substance with half-life of 6 years to decay to 6.25% of its original quantity?
2. What is the equation of the tangent line to $f(x) = 4x^2 \sin(x)$ at the point $(0, 0)$? And at the point $(\pi, 0)$?

3. Given

$$f(x) = 3x\sqrt{e^{3x^2} + 8},$$

find $f'(0)$.

4. Evaluate $\int_0^\pi \cos(10000t) dt$.
5. Find the critical points of $f(x) = x^3 - \frac{15}{2}x^2 + 18x - 20$.
6. Which of the points that you found in the previous problem is a local minimum?
7. Where does the function above have a global maximum in $[1, 4]$?

2 Answers:

1. 24 yrs.
2. at $(0, 0)$ $y = 0$ (yes, plot it!). at $(\pi, 0)$ $y = -4\pi^2 x + 4\pi^3$.
3. 9
4. 0
5. $x = 2$ and $x = 3$
6. local minimum $x = 3$
7. global maximum in $[1, 4]$ is at $x = 4$