

Quiz 14 Solution

November 27, 2017

1. (2 points) Evaluate $\int_0^6 2e^x dx$.

Solutions:

$$\begin{aligned}\int_0^6 2e^x dx &= 2e^x \Big|_0^6 \\ &= 2e^6 - 2e^0 \\ &= 2e^6 - 2\end{aligned}$$

Answer: $2e^6 - 2$

2. (2 points) The growth rate of the population of a county is $P'(t) = \frac{1}{2}\sqrt{t}$, where t is the time in years. How much does the population increase from $t = 1$ year to $t = 9$ years?

Solution: By the Fundamental Theorem of Calculus, $P(9) - P(1) = \int_1^9 P'(t) dt$. So

$$\begin{aligned}P(9) - P(1) &= \int_1^9 \frac{1}{2}\sqrt{t} dt \\ &= \int_1^9 \frac{1}{2}t^{1/2} dt \\ &= \frac{1}{2} \left(\frac{2}{3}t^{3/2} \right) \Big|_1^9 \\ &= \frac{1}{3}t^{3/2} \Big|_1^9 \\ &= \frac{1}{3}(9^{3/2} - 1^{1/2}) \\ &= \frac{1}{3}(27 - 1) \\ &= \frac{26}{3}\end{aligned}$$

Answer: $\frac{26}{3}$

3. (1 point) What was your favorite part of break?

Answer: Answers will vary.