

Quiz 4 Solution

September 11, 2017

1. (2 point) The population of birds after t years is given by $P(t) = 10t^2 - t + \cos t + 100$. What is the rate of change of the population after 3 years? Leave your answer **exact**.

Solution:

This is asking us to find $P'(3)$.

$$\begin{aligned}P'(t) &= 10(2t) - 1 + (-\sin t) \\&= 20t - 1 - \sin t\end{aligned}$$

So $P'(3) = 20(3) - 1 - \sin 3 = 59 - \sin 3$

Answer: $59 - \sin 3$

2. (2 points) The height (in feet) of a ball dropped on Gallifrey is given by $s(t) = t^2 - t + 12$, where t is measured in seconds. When is the velocity equal to 3 feet per second?

Solution: This is asking us to find when $v(t) = 3$ feet per second.

$$\begin{aligned}v(t) &= s'(t) \\&= 2t - 1\end{aligned}$$

Now, solve $v(t) = 3$:

$$\begin{aligned}2t - 1 &= 3 \\2t &= 4 \\t &= 2 \text{ seconds}\end{aligned}$$

Answer: 2 seconds

3. (1 point) What is one of your hobbies?

Answer: Answers will vary.