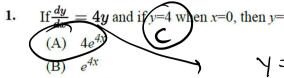
Skill Builder: Topic 7.8 – Exponential Models with Differential Equations

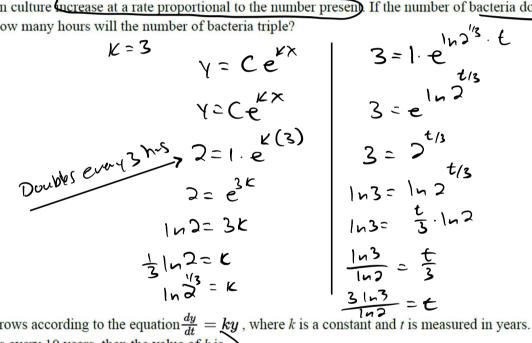
APClassroom Assignment Hw 7.8



- (C) $3+e^{4x}$

= K.Y

- Bacteria in a certain culture ucrease at a rate proportional to the number presen. If the number of bacteria doubles 2. in three hours, in how many hours will the number of bacteria triple?
 - (A) 3ln3/ln2
 - $2\ln 3/\ln 2$
 - (C) ln3/ln2
 - (D) ln(27/2)
 - (E) ln(9/2)

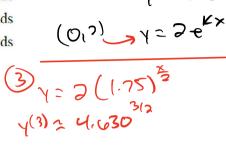


the equation
$$\frac{dy}{dt} = ky$$

- Population y grows according to the equation $\frac{dy}{dt} = ky$, where k is a constant and t is measured in years. If the population doubles every 10 years than the relation $\frac{dy}{dt} = ky$ 3. population doubles every 10 years, then the value of k is
 - (A) 0.069
 - (B) 0.200
 - (C) 0.301
 - (D) 3.322
 - (E) 5.000

- 4. A puppy weighs 2.0 pounds at birth and 3.5 pounds two months later. If the weight of the puppy during its first 6 months is increasing at a rate proportional to its weight, then how much will the puppy weigh when it is 3 months old? dy = KY
 - (A) 4.2 pounds (B) 4.6 pounds

- (C) 4.8 pounds (D) 5.6 pounds
- (E) 6.5 pounds



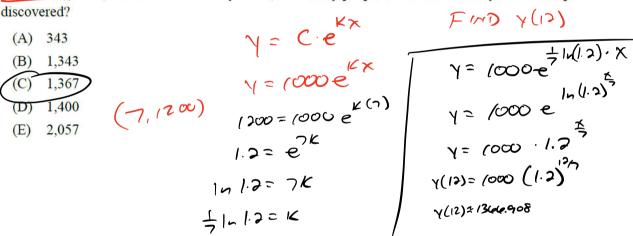
3.5= 2e (2, 3.5)

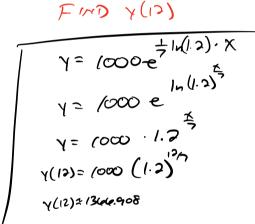
$$\frac{1}{2} \ln (1.75) = K$$

$$Y = 2e^{(\ln 1.75)^{\frac{1}{2}}} \cdot \times$$

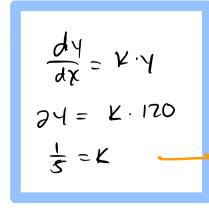
$$Y = 2(1.75^{\frac{1}{2}})$$

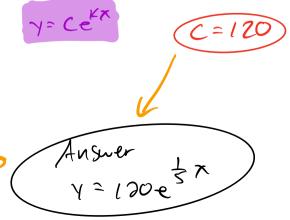
During a certain epidemic, the number of people that are infected at any time increases at a rate proportional to 5. the number of people that are infected at that time. If 1,000 people are infected when the epidemic is first discovered, and 1,200 are infected 7 days later, how many people are infected 12 days after the epidemic is first discovered?





- 6. The weight of a population of yeast is given by a differentiable function y, where y(t) is measured in grams and t is measured in days. The weight of the yeast population increases according to the equation $\frac{dy}{dt} = ky$, where k is a constant. At time t = 0, the weight of the yeast population is 120 grams and is increasing at the rate of 24 grams per day. Which of the following is an expression for y(t)?
 - (A) $120e^{24t}$
 - (B) $120e^{t/5}$
 - (C) $e^{t/5} + 119$
 - (D) 24t + 120





- The population P of a city grows according to the differential equation $\frac{dP}{dt} = kP$, where k is a constant and t is measured in years. If the population of the city doubles every 12 years, what is the value of k? 7.
 - (A) 0.058
 - (B) 0.061
 - (C) 0.167
 - (D) 0.693
 - (E) 8.318

p=cekt

- If $\frac{dy}{dt} = ky$ and k is a nonzero constant, then y could be

 - (B) 2e^{kt}
 - (C) $e^{kt}+3$
 - (D) kty+5 X
 - (E) $\frac{1}{2}ky^2 + \frac{1}{2}$

Y= CeKX

Oil is being pumped continuously from a certain oil well at a rate proportional to the amount of oil left in the well; that is $\frac{dy}{dt} = ky$ where y is the amount of oil left in the well at any time t. Initially there were 1,000,000 gallons of oil in the well, and 6 years later there were 500,000 gallons remaining. It will no longer be profitable to pump oil when there are fewer than 50,000 gallons remaining.

At what rate is the amount of oil in the well decreasing when there are 600,000 gallons of oil remaining?

$$V = (e^{kt})$$

$$V =$$

$$\frac{dy}{dt} = XY$$
when $Y = (\alpha\alpha, \alpha\alpha)$

$$\frac{dy}{dt} = \frac{1}{6} \ln(\frac{1}{2}) \cdot (\alpha\alpha, \alpha\alpha)$$

$$\frac{dy}{dt} = \frac{1}{6} \cos(\alpha\alpha) \cdot \ln(\frac{1}{2})$$
or
$$\frac{dy}{dt} = -(00, 000 \ln(2))$$