

1989-AB6

6. 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.

- (a) Write an equation for y , the amount of oil remaining in the well at any time t .
 - (b) At what rate is the amount of oil in the well decreasing when there are 600,000 gallons of oil remaining?
 - (c) In order not to lose money, at what time t should oil no longer be pumped from the well?
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