



## The Calculus Volume 20 (Paperback)

By Ellery Williams Davis

Rarebooksclub.com, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book \*\*\*\*\* Print on Demand \*\*\*\*\*. This historic book may have numerous typos and missing text. Purchasers can usually download a free scanned copy of the original book (without typos) from the publisher. Not indexed. Not illustrated. 1912 edition. Excerpt: .  $y = oe^{-bt} \sin(\omega t + \phi)$  is a damped vibration, which may be written (5)  $y = A \sin(\omega t + \phi)$ , where  $A = aebt$ . Here  $A$  is a variable decreasing amplitude, whose relative rate of decrease is  $-dA/dt = -bA$ ; that is, the relative rate of decrease of  $A$  is constant. The successive derivatives of  $y$ , by (4), are:  $-ae^{-bt} \omega \cos(\omega t + \phi) + k \cos(\omega t + \phi) = ae^{-bt} \omega^2 \sin(\omega t + \phi) - 2fc \cos(\omega t + \phi)$ , whence it follows that (6)  $+2f^2 + (2 + fc^2)j = 0$ . Equations which contain derivatives are called differential equations; thus (6) is the fundamental differential equation for damped vibrations. EXERCISES XXXV.--DAMPED VIBRATIONS 1. Each of the following equations represents a damped harmonic vibration; find the speed and the acceleration in each case; and write an equation connecting...



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