



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

∴ Any one term of the first series represents a wave which travels the space between one particle and the next in time T . In the same way the corresponding term of the second series represents a wave which travels in the opposite direction with the same velocity.

Now $v = \text{velocity} = l/T = l'c \sin \theta / \theta$; but $\theta = \pi/q$ and $c = \sqrt{\frac{E}{ml}}$.

$$\therefore v = l' \sqrt{\frac{E}{ml}} \frac{q}{\pi} \sin \frac{\pi}{q}.$$

141. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, England.

A simple pendulum hangs from a bicycle moving in a straight line. What deflection is produced by putting on the brake so as to exert on the machine a force equal to the n th of its weight?

Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics in The Temple College, Philadelphia, Pa.

Let $v = \text{velocity of retardation}$, $W = \text{weight}$.

Then $v = \frac{Wg}{nW}t = \frac{g}{n}t$. Let $t = 1$. ∴ $v = g/n$.

If $\theta = \text{angle of deflection of the pendulum}$, and $l = \text{its length}$, then $v^2 = g^2/n^2 = 2gl(1 - \cos \theta)$.

$$\therefore \cos \theta = \frac{2ln^2 - g}{2ln^2} \text{ or } \theta = \cos^{-1} \left(\frac{2ln^2 - g}{2ln^2} \right).$$

142. Proposed by GEORGE R. DEAN, B. Sc., Professor of Mathematics, University of Missouri School of Mines and Metallurgy, Rolla, Mo.

An infinite mass of liquid is bounded by the plane zx , on which are small corrugations given by $y = \phi(x)$. The velocity of the liquid at an infinite distance from the plane is parallel to x and equal to V . Prove that the velocity potential is $V_x + \frac{V}{\pi} \int_{-\infty}^{\infty} \frac{(x-\lambda)\phi(\lambda)d\lambda}{y^2 + (x-\lambda)^2}$. [Bassett's *Hydrodynamics*.]

Solution by G. B. M. ZERR, A.M., Ph.D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

Let $f = \text{velocity potential}$.

Then $\frac{d^2 f}{dx^2} + \frac{d^2 f}{dy^2} = \frac{d^2 f}{dx^2} \left(1 - \frac{1}{[\phi'(x)]^2} \right) = 0$.

$$\therefore \frac{df}{dx} = \text{constant} = v \text{ when } y = \infty. \quad \therefore f - C = v \int dx = v\phi_1(x).$$

When $y = 0$, $f = \phi_1(x)v$; when $y = \infty$, $\phi(x) = x$.

$$\therefore C = vx. \quad \therefore f = vx + v\phi_1(x).$$

By Fourier's series, $\phi_1(x) = \frac{1}{\pi} \int_{-\infty}^{\infty} \phi(\lambda)d\lambda \int_0^{\infty} \sin \beta(x-\lambda)d\beta$.