

$$\pounds 441 \div \{ (\frac{400}{100})^4 - \frac{200}{100} \} = \pounds 27657$$

(115.) Which is the greater—the cube root of 69 or the fourth root of 283? Solve by multiplication.

EDITOR.

The twelfth powers will retain the same relative magnitude as the roots themselves. The twelfth power of the cube root of 69 is the fourth power of 69 itself = 22667121. The twelfth power of the fourth root of 283 is the cube of 283 = 22665187. ∴ the cube root of 69 is the greater. The roots are respectively 4.101566 and 4.101537.

(116.) A heavy uniform beam rests on two given smooth planes, it is required to find the position of the beam, and the pressure on the planes.

SELECTED.

Let the length of the beam be $2l$, its weight W acting at the centre of gravity G . Let the inclination of the planes to the horizon be respectively a and b and the inclination of the beam c . Let R and R' be the pressures of the planes on the beam, the lines of action of which forces are perpendicular to the planes by reason of their smoothness. Hence we have

Horizontal forces ; $R \sin a = R' \sin b$

Vertical forces ; $W = R \cos a + R' \cos b$

Moments about G ; $Rl \cos(a - c) = R'l \cos(b + c)$

$$\therefore \tan c = \frac{\sin(a - b)}{2 \sin a \sin b}$$

$$R = \frac{W \sin b}{\sin(a + b)},$$

$$R' = \frac{W \sin a}{\sin(a + b)}$$

QUESTIONS FOR SOLUTION.

117. A beetle crawls from one end of a fixed rod to the other end, find in terms of the length of the rod and of the weights of the rod and of the beetle, the consequent alteration of the centre of gravity of the rod and beetle.

C. A. BARNES, Ottawa.

118. Reduce $\frac{1}{7}$, $\frac{5}{13}$, $\frac{7}{19}$, and $\frac{3}{23}$ to decimals using multiplication only.

EDITOR.

119. Find the present value of an annuity to continue n years, allowing simple interest upon each sum from the time it becomes due; and explain why the present value of an annuity to continue forever cannot be estimated upon these principles.

SENATE HOUSE, CAMBRIDGE, 1834.

A person about to purchase the lease of an estate, is able continually to invest money at the rate of four per cent. per annum, receiving the interest half-yearly; show that if the tenant pays his rent half-yearly, the value of the lease to the purchaser is 1.01 times what would be its value if the tenant paid his rent yearly.

DITTO.

There seems to be some unaccountable difficulty in obtaining Abbott's works on grammar. We have been informed that Mr. W. Bryce, London, Ontario, can supply them either through the local booksellers or direct by post, postage prepaid on receipt of price. How to tell the Parts of Speech, 60 cts. How to Parse, \$1. Mr. Bryce has also received a supply of the new History of Canada by Jeffers, 60 cents including postage.

EDITOR'S DRAWER.

—In any case where a teacher fails to get any issue of the "TEACHER" we re-mail it if notified promptly.

—During the four years (1871-1874) upwards of \$2,000,000 have been expended in Ontario, in the purchase or enlargement of school sites, and the erection and repairs of school houses. This certainly speaks well for the educational progress of the country.

—The *Journal of Education* says no books have

been struck off the authorized list except Peck Ganot's Natural Philosophy, Davidson's Animal Kingdom, and Collier's English Literature. The geographical text-books are undergoing revision.

—The new High School Programme, adopted by the Interim Committee of the Council of Public Instruction has been approved of by his Excellency the Lieutenant Governor in Council. The first intermediate High School Examination will be held some time in June next.