way contains *eight* cubic feet. A cubic *three* feet every way contains *twenty-seven* cubic feet. From this you can induce the law that the solid contents of (similar) cubes vary as the cubes of their ages or diameters. In solid geometry it is proven that the same property holds for all similar figures. If one sphere has *twice* the diameter of another, it has *eight* times the volume. ($2^3 = 8$). If it has *ten* times the diameter, it has 1,000 times the volume ($10^3 = 1,000$). Four quarts are equal to one gallon. One bushel $= 8$ gallons. There the *volume* of the one measure is eight times the volume of the other; end it follows, that the diameter of the one will be exactly twice the diameter of the other. The diameter of the smaller measure is therefore $9\frac{1}{4}$ inches.

This general theorem will be useful. " The areas of all surfaces of the same shape are proportional to the squares of any corresponding lines in them; and *vice versa*, these lines are proportional to the square roots of the areas." For all solids of the same shape, change *area* in the above to *volume* and *square* to *cube* and you have the rule.

TEACHER.—Please solve the following in next REVIEW (Loomis Trigonometry, page 122) viz: The base of a triangle is 40 feet and its altitude 18 feet. It is required to draw a line parallel to the base so as to cut off a trapezoid containing 80 square feet. What is the length of the line of section and its distance from the base of triangle. 2. Wormell' Geometry, page 223-1: Taking the radius of a circle as unity, find the length of the side of an inscribed equilateral triangle.

ANS. 1.—Area triangle$=180$ sq. ft. When trapezoid of 80 sq. ft. is cut off by a line parallel to the base, there is left a similar triangle of 100 sq. ft. But similar areas are proportional to squares of similar lines — their altitudes, for example:

$$\therefore 180 : 100 :: 18^2 : x^2$$
$$180 : 100 :: 324 : x^2$$
$$180x^2 = 34200 \therefore x^2 = 180$$
$$\therefore x = \sqrt{180} = 6\sqrt{5}$$

$\therefore (18 - 6\sqrt{5}) =$ distance between the two lines, $= 6(3 - \sqrt{5})$.

To find length of line,

$$180 : 100 :: 20^2 \text{ to } x^2 \therefore 180x^2 = 40000$$
$$\therefore x^2 = 4000 = 2000 = 400 \times 5 \therefore x = 20\sqrt{5}$$

$$\frac{18}{} \quad \frac{9}{} \quad \frac{9}{} \quad \frac{3}{}$$

= length of line.

2. Draw the circle with inscribed equilateral triangle. Join the angular points with the centre. These three radii are given equal to 1, find the side of the triangle.

As there are 360° in a circle each side of the triangle subtends an angle of 120°. Bisect of these angles by a line which with also bisect a side of the

given triangle perpendicularly. The triangle thus formed has angles, therefore, respectively, 90°, 60° and 30°. The sides subtending these angles are, therefore, (by an lementary geometrical demonstration) in the ratio of $1 : \sqrt{3} : \frac{1}{2}$. As the side opposite 90° is given equal to 1, $\therefore$ side opposite $60° = \frac{\sqrt{3}}{2}$ = half side $\therefore$ whole side of inscribed triangle $= \frac{\sqrt{3}}{2} \times x2 = \sqrt{3}$.

Colenzo at page 48 of Part II. of his Algebra gives:

$$x^3 = 31x^2 - 4y^2$$
$$y^3 = 31y^2 - 4x^2$$

Putting $u + v = x$ and $u - v = y$ an the equation, subtracting, and adding remainder, gives $v^2 = 70u - 3u^2$. From this u and v are found $= 10$ and 20 respectively. Substituting these values for x and y fails to fulfil conditions of equation. Please explain why?— SUB.

ANS.—Cannot find your problem in given page in our edition of Colenso (Longmans, London, 1870.) U and v cannot be found from the one equation $v^2 = 70v - 3v^2$, as one equation with two unknown quantities is *indeterminate*. 10 and 20 will satisfy this equation, and so will an infinite set of other numbers. For instance, if v be assumed $= 1$, then $u =$ two numbers. If $v = 2$, then u has two other values, and so on.

BOOK REVIEWS.

DAS HAIDEDORF, von Adalbert Stifter, edited for the use of schools by Otto Heller, Philadelphia. Price 20 cents. Publishers, D. C. Heath & Co., Boston, Mass.

SHAKESPEARE'S AS YOU LIKE IT, with Introduction and Notes by K. Deighton. London: MacMillan & Co. and New York. Price 1s. 9d. The numbers of this convenient scholar's edition of Shakespeare are being rapidly brought out by MacMillan & Co. In "As you Like It" there is the same finished style, both of editor and printer, which is observable in the previous numbers.

THE CHILDREN'S PRIMER, by Miss Ellen M. Cyr, author of the "Interstate Primer," etc.; $7\frac{1}{4}$ inches by $5\frac{1}{2}$ inches; cloth, pp. 24. Ginn & Co., Boston, Mass., U. S. A., 1891. An admirable selection of words, sentences and illustrations for the first exercises in reading. Typography, beautiful.

EDMUND BURKE.—Speeches on the American war, and letter to the sheriffs of Bristol, with introduction and notes by A. G. George, A. M. Pp. 19 by 242; $7\frac{1}{4}$ by 5 inches; paper board; $0.50. Boston, U. S. A.: D. C. Heath & Co., 1891. This volume is one which will interest any intelligent citizen, and particularly Americans. Burke was a great American statesman and orator who was never an American, just as many Americans are real Englishmen although never English-