What is a school and what is it for? The idea is indefinite in the minds of many that it is both public and private. It is a public institution in the fact that it is supported by the public fund; yet it is often used to promote private ends. Who should teach in it? The idea that a town or district must supply its own teachers so as to keep the money spent at home must give way; the child's needs should be supplied with the best teachers, no matter where they come from. No one should be considered to hold a mortgage on a situation in any school on account of long service, infirmity, family needs, political, or sectarian relations. The teacher's continuance in service should rest upon a strictly professional and business basis; politics should not enter into the matter. *N. Y. School Journal.*

QUESTION DEPARTMENT.

F. W. W. Divide the frustrum of a pyramid 12 feet long, 4 feet square at one end and 1 foot square at the other into two equal sections (by a plane parallel to the base).

Let x feet = the height of the portion added to the frustrum to complete the pyramid.

$$\text{Then } \tfrac{1}{2} : 2 :: x+12 : x$$
$$x = 4$$

Then the part added to complete the pyramid $= 1\tfrac{1}{3}$ cubic feet. But the frustrum $= 84$ cubic feet.

Half the frustrum + the added part is a pyramid $= 43\tfrac{1}{3}$ cubic feet.

Comparing this and the added part we have the proposition,

$$1\tfrac{1}{3} : 43\tfrac{1}{3} :: 4^3 : (12.74)^3 \text{ nearly.}$$

∴ the required height $= 12.74 - 4 = 8.74$ feet nearly.

MONCTON. Please give your opinion on the following if space will permit:

$$\left\{ (\tfrac{3}{4} + .01 - .036) \times \tfrac{3}{8} \right\}$$

Which do you consider the better way, to work it as wholly decimal, as

$$(.75 + .01 - .036) \times .375$$

or to work it as fractions:

$$\left\{ (\tfrac{3}{4} + \tfrac{1}{100}) - \tfrac{36}{1000} \right\} \times \tfrac{3}{8}$$

and all similar questions. Which method do you recommend to be given to pupils, and why?

I much prefer the latter way, especially as your fraction may sometimes be a recurring decimal.

The latter way is to be preferred for the reasons you state; but on inspection of such a question, the working it by decimals, or by vulgar and decimals combined, may be preferred. Thus in the above question it is better to reduce the terms within the parenthesis by decimals and then find $\tfrac{3}{8}$ of the result.

A. M. S. The best work for the study of our birds is Cone's Key to the Birds of North America. $7.50. (Estes & Laureat, Boston)

N. McL. A runs a mile race with B and loses; had his speed been a third greater he would have won by 22 yards.

$$\text{Let } x = \text{B's speed}$$
$$y = \text{A's }$$

If A's speed becomes a third greater it will be $\tfrac{4}{3}$

$$\text{Then } \frac{1740}{x} = \frac{1760}{4y}$$
$$22x = 29y$$

Ratio of A : B = 22 : 29

A. P. (1) Hamblin Smith's Arithmetic, page 184, Ex. III, 4.

Solved May, 1895.

(2) A man has $400 he wishes to invest in stock. He wishes to buy 100 animals. He buys cows at $20, sheep at $4 and hens at 20 cents apiece. Find the number of each.

$$\text{Let } x = \text{number of cows}$$
$$y = \text{" sheep}$$
$$z = \text{" hens}$$

$$\text{Then } 20x + 4y + \frac{z}{5} = 400$$
$$x + y + z = 100$$
$$100x + 20y + z = 2000$$
$$99x + 19y = 1900$$
$$\frac{99x}{19} + y = 100$$

Let $x = 19$, then $y = 1$ and $z = 80$

EMERALD. Three circular flower beds, each bounded by a line 355 inches in length, are situated so that their circumferences are in contact. Find the area of the triangular space lying between and not included within the beds.

The lines joining the centres of the circles will form an equilateral triangle whose sides will each be 113 inches and whose area will be 5528·997 sq. inches.

Find the area of the three sectors within the triangle $\tfrac{1}{2}$ area of one of the circles = 5014·386 sq. inches.

Then 5528·977 - 5014·386 = 514·59 square inches = required area.

(2) 40% of a mixture of wine and water is wine. When 10 gallons of water are added the wine is 35% of the whole. How many gallons are there in the mixture?

40% of the mixture = 35% of the mixture + 35% of the 10 gallons.

∴ 5% of the mixture = 35% of the 10 gallons.

∴ 100% of the mixture = 70 gallons.