A crop of wild oats may be better than utter barrenness' but better still is it to plant and nourish those seeds that will produce a harvest of positive good in the future. It is because it does this work of keeping active and occupied the minds of those who are too young or too poor to be sent away to school, that teachers of country schools ought always to be willing to have a fifth class.

But there are other reasons. The presence of such a class is a positive benefit to the school in many ways. The junior pupils are made to realize that there is a position above them, to which they may attain in time by being diligent. The knowledge that his older schoolmates have conquered difficulties that now beset him, is an assurance to every younger pupil that he too may overcome them. The teacher will find this advanced class to be also a valuable aid in governing the school—that is, if they are wisely governed themselves. The teacher makes the school (if he remains in it long enough,) but he must form the character of the smaller boys and girls mainly by means of the influence of the larger ones.

How to find time for so many recitations in a non-graded rural school is, however, a serious problem. The fifth class will study quite a number of subjects, and time for recitation must be provided for all of them. The task of arranging a suitable time-table is somewhat difficult, but it can be accomplished. We must avoid too much crowding. Some subjects will require three lessons per week, while others require only two, and still others, but one. Sometimes two classes in the same subject can be combined with advantage. There are also some recitations by the junior classes that may, without much loss, be conducted by the teacher and one of the senior pupils alternately. By giving one class to one assistant in the morning, and another class to another assistant in the afternoon, the teacher will be able to control and direct the work of these classes tolerably well, and also economize time considerably.

The senior class should be trained to self help as much as possible in pursuing their studies. The teacher may direct, encourage, and assist them when they require it, but he need not remove every obstacle from their path, nor carry them over rough places. If this plan is followed, the fifth class recitations need not be so lengthy, nor so frequent, as to leave scant time for the other work of the school

Examination Papers.

YALE COLLEGE, NEW HAVEN, CONNECTICUT.

EXAMINATION FOR ADMISSION.

1. Divide 82.1 by 41; 8.21 by .41, and .821 by 410.
Carry the result in each case to four decimal places.
(a) = 821÷410; (b)=821÷41; and (c)=821 by 410000.
(b) = 10 times (a); (c)=1000th of (a). Only one division necessary.

2 Find the value of $\sqrt{(.146^2+.063^2)}$ to three decimal places.
Explain $=\sqrt{.002136+.003969}=\sqrt{(.006105)}=.078$.

3 Divide $\frac{3\frac{3}{5}+\frac{6}{5}+1\frac{1}{2}}{\frac{2}{3}\text{ of }5\frac{7}{3}}\times\frac{1}{\frac{4}{5}}$ by $\frac{133}{141}$

Explain $=(3\frac{3}{5}+\frac{6}{5}+1\frac{1}{2})\times\frac{3}{2}\times\frac{8}{17}\times\frac{5}{4}\times\frac{141}{133}=$&c.

4. Some sugar is adulterated as follows:—$\frac{3}{5}$ is worth 8 cents per lb., $\frac{1}{5}$ is worth 10 cents, $\frac{2}{17}$ is worth 12 cents, and the remainder 33 lbs. is sand. What is the mixture worth per lb.?
$\frac{3}{5}+\frac{1}{5}+\frac{2}{17}=\frac{78}{85}\therefore 33\text{ lbs}=\frac{11}{85}$ mixture, $\therefore$ mixture=270 lbs.
81 lbs. at 8 cents, 120 lbs. at 10 cents, 36 lbs. at 12 cents, and 33 lbs. at 0 cents, gives 270 lbs. worth, etc., etc.

5. Bank stock at 170 pays 12½ per cent. annual dividend. What rate of interest does a buyer receive?
$170 yields $12\frac{1}{2}$, $\therefore$ 340 yields 25, and 100 yields $\frac{2500}{340}=7\frac{6}{17}$.

6. Find the depth in metres of a cubical cistern which has a capacity of 30,000 liters. Give the result to three decimal places.
1 litre = 1 cub. decimeter = 1000th of a cub. meter.
$\therefore$ 30,000 litres = 30 cub. meters.
$\therefore$ Depth $=\sqrt[3]{30}=3.107232$ meters.

ELEMENTARY GEOMETRY.

QUESTIONS AND EXERCISES.

1. What angle do the hands of a clock make at 5 o'clock?
2. Find the value of two adjacent supplementary angles, one of which is nine times as large as the other.
3. One acute angle of a right triangle is 51° 31′; find the other acute angle.
4. The sum of the angles of a polygon is 48 right angles; find the number of sides.
5. Make a quadrilateral having the greatest possible number of obtuse angles.
6. Find the angle formed by the bisectors of two angles in an equilateral triangle.
7. The bisector of a base angle in an isosceles triangle makes with the opposite leg an angle of 52° 15′; find all the angles of the triangle.
8. Find all the angles in an isosceles triangle of which the altitude is equal to half the base.
9. If two sides of a triangle are 12 in. and 15 in., between what limits must the other side lie?
10. Into what figures is a rhombus divided by drawing one diagonal? two diagonals?
11. In a right triangle one leg is equal to half the hypoteneuse; find the acute angles.
12. If three circles touch one another in any way the mutual tangents all intersect at the same point.

SOLUTION.

(a) *External Contact.*—Join the three centres O P Q, so as to form the triangle O P Q. The lines O P, P Q, Q O, must pass through the points of contact R S T, Bisect L's, P O Q, and P Q O, by O K, and Q K meeting in K. Join K R, K S, K T. It is easily shown that these three lines are equal. Hence the circle R S T touches the lines O P, P Q, Q O, and hence P K, K S, and K T are perpendiculars on O P, P Q and Q O, therefore they are tangents.

(b) *Internal Contact.*—Join O and P, the centres of the internal circles which touch in R; O P passes through R. Join O T, P S, the other points of contact. Bisect L's, T O P, and O P S, by O K, meeting in R. Join K T, K R, R S. They are easily shown to be equal and perpendicular to the lines T O, O P, P S, respectively, and hence they are the tangents to the three circles.

UNITED COUNTIES OF DUNDAS, STORMONT AND GLENGARRY. — UNIFORM AND PROMOTION EXAMINATION, NOVEMBER 28th, 1884.

LITERATURE.—CLASS II.

THE FOX AND THE RAVEN.

One day a raven had a large piece of cheese. Did he share it with those who had none? No. He said: "Oh, that I could find a place in which to eat it alone!" He flew to the woods and perched on the branch of a tree.

A fox passing by, saw him, and said: "O, that I had some of that cheese! The old raven is stingy, and would not give me any if I should ask him. I will play him a trick."

At once the fox seated himself at the foot of the tree, and said: "What a beautiful bird you are! How glossy your plumage is! Do you know that I never heard you sing? Is your voice as fine as your looks? Pray sing a little for me. Do not be bashful. Sing one of your favorite songs."

The raven began to think that the fox was a very pleasing fellow. He thought: "How charmed he will be to hear my voice!"
So he opened his mouth to sing. What do you think happened? Yes, of course, the cheese fell to the ground. Did the fox pick it up and politely hand it back to the raven? No, indeed! He seized it and ran off, laughing at the foolish raven.