Thy meditative odd replies Cast out like arrows on the air, The humour in thy dark blue eyes, The wisdom in thy silver hair.

These will grow faint, shade after shade, As those who loved thee pine and pass; But all thy being was not made

To shrink like breath upon a glass.

Thou with new graces didst maintain The uncharm'd, outworn scholastic seat, Throned, simply, with an ardent train

Of studious beauty round thy feet.

Those girls, grown mothers soon, will teach Their sons to praise thy laurell'd name, Thy hand that taught their hands to reach The broader thought, the brighter flame.

So thou, though sunk amidst the gloom That gathers round our reedy shore, Shall with suffused light illume A thousand hearts unlit before. —Edmund Gosse, in the Critic:

"Don't break uniformity of discipline, but break uniformity of teaching." Saint-Marc Girardin.

## SCHOOL WORK.

2

## MATHEMATICS.

I. E. MARTIN, B.A., R.M.C., KINGSTON, EDITOR.

(Continued from page 155.)

TRIGONOMETRY.

## Solutions by Gent. Cadet Batt. Serg.-Maj. W. Dumble, R. M. C., Kingston.

NOTE.—Candidates are required to take all the questions of section A and any two of section B.

Α.

1. (a) Define an angle according to the usage of Plane Trigonometry.

(b) Define the common units of angular measure.

(c) Express in sign and magnitude in each of the units, the angle described by the minute hand of a clock between the times 9h. 5m. and 11h. 55m.

I. (a) Book work.

(b) Book work.

(c) Time elapsed = 2h. 50m., during which min. hand passes over -720 (---)  $3 \cdot 360 = -1020^{\circ}$ .

$$\frac{A}{180^{\circ}} = \frac{\theta}{\pi} \frac{-1020}{180} = \frac{\theta}{\pi};$$
$$\therefore \theta = \frac{-17\pi}{3} \text{ circ. meas.}$$

 $-\frac{1020 \cdot 10}{9} = -1133^{g} 33^{m} 33^{s} \cdot 33 \text{ grades.}$ 

2(a) Define sin A. cos A, tan A, and cot A, when A is less than a right angle.

(b) Deduce from a geometrical construction the algebraic value of  $\frac{\pi}{2} + a$ , when a is less than  $\frac{\pi}{2}$ .

(c) Find the value of each of the following:  $\pi$   $\pi$   $\pi$ 

$$\frac{\sin \frac{\pi}{4}}{4}, \frac{\cos \frac{\pi}{3}}{5}, \tan \frac{\pi}{6}.$$
2. (a) Books work.  
(c)  $\sin \frac{\pi}{4} = \sin 45^\circ = \frac{1}{\sqrt{2}} \cdot \cos \frac{\pi}{3}$ 

$$= \cos 60^\circ = \frac{1}{2} \cdot \tan \frac{\pi}{6} = \tan 30^\circ = \frac{1}{\sqrt{2}}$$

3. (a) Express all the Trigonometric functions of a given angle in terms of its sine.

(b) Find the value of  $\theta$  and of  $\psi$  from the equations  $\sin \theta = \frac{1}{2}$ , and  $\tan \psi = \sqrt{3}$ .

(c) Given  $\sin 2\theta = \cos 3\theta$ , find  $\theta$  and  $\sin \theta$ . 3. (a) Book work.

(b) 
$$\sin \theta = \frac{1}{2}$$
.  $\therefore \theta \stackrel{\checkmark}{=} 30^\circ$  or 150°. Tan  
 $\psi = \sqrt{3}$ .  $\psi = \frac{1}{60}\circ$ .

(c) Sin  $2\theta$  = cos  $3\theta$  or  $2 \sin \theta \cos \theta = 4 \cos 3\theta$   $3\theta - 3 \cos \theta$ .  $\cos \theta = 0$  or  $2 \sin \theta = 4$   $4 \cos 2\theta - 3$ .  $2 \sin \theta = 4 - 4 \sin 2\theta - 3$ .  $4 \sin^2 \theta + 2 \sin \theta = 1$ .

$$\sin^2\theta + \frac{\sin\theta}{2} + (\frac{1}{4})^2 = \frac{1}{4} + \frac{1}{1^2} = \frac{1}{1^2} + \frac{1}{1^2} = \frac{1}{1^2} + \frac{1}{1^2} = \frac{1}{1^2} + \frac{1}{1^2} = \frac{1}{1^2} + \frac{1}{1^2} + \frac{1}{1^2} = \frac{1}{1^2} + \frac{1}{1^2} + \frac{1}{1^2} = \frac{1}{1^2} + \frac{1}{1^2} + \frac{1}{1^2} = \frac{1}{1^2} + \frac{1}{1^2}$$

Sin 2  $\theta = \sin(90-3\theta)$   $\therefore 2\theta = 90-3\theta$ or  $5\theta = 90$ .  $\therefore \theta = 18^{\circ}$ .