

EXAMINATION PAPERS.

10. Shew how to determine the surface of a right circular cone. The height of a frustrum of such a cone is 3 feet, radius of base 2 feet, and semi-vertical angle  $30^\circ$ ; find its surface. If this surface were made of paper, and being cut from the cone were spread on a flat surface, find the dimensions of the curve formed by what was the bottom edge of the cone.

JULY EXAMINATIONS, 1881.

INTERMEDIATE.

1. Find the L. C. M. of 545, 26487, 1853, 11421.

One kind of brick is  $4\frac{1}{2}$  inches long and  $2\frac{3}{4}$  high; another 5 inches long and  $3\frac{1}{2}$  high. What is the size of the least piece of wall, height being same as length, that can be constructed of either kind of brick.

2. Define the numerator and denominator of a fraction, and from your definitions prove that

$$\frac{3}{4} \times 5 = 1\frac{3}{4}, \quad \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}.$$

3. Simplify

$$\left\{ \frac{\frac{1}{2} \text{ of } 11\frac{1}{2} + \frac{1}{7} \text{ of } 7\frac{1}{2}}{88\frac{1}{2} - 6\frac{1}{2}} + 8\frac{1}{8} \right\} \div \left\{ \frac{\frac{1}{2} \text{ of } 6\frac{1}{2} - 2\frac{1}{2}}{25 + \frac{1}{7} \text{ of } 8\frac{1}{2}} \right\}$$

Add together  $\frac{1}{2}$  of 1 wk. 2 dys. 17 hrs.,  $\frac{1}{3}$  of 17 hrs. 23 min. 26 sec., and  $\frac{1}{4}$  of 2 dys.

(Accuracy of result essential in preceding fractions.)

4. Describe briefly the metric system of measures.

If a gallon contain 277 cub. in., and a dekalitre contain 17.6077 pints, express a metre in inches.

5. If  $A$  walk 7 hours a day, and  $B$  6 hours a day, and if, under like conditions,  $B$  can walk 6 miles while  $A$  is walking 5, how many days will  $A$  be walking down hill a distance which  $B$  accomplishes up hill in 3 days; supposing that a man's rate of walking is increased by one-third in going down hill, and decreased by one-fourth in going up?

6. If 1000 men can excavate a square basin whose side is 1,600 yds., and which is 30 yds. deep, in 9 months, how many will be required to excavate a square basin whose side is 2,000 yds., and which is 40 yds. deep, in 12 months?

7. The hands of a clock move irregularly, the hour hand moving 5 per cent. too fast, and the minute hand 10 per cent. too slow. In 15' (true time) they will be together; how many minutes, measured on the face of the clock, are they apart now?

8. A money lender has \$1,500 out at 8 per cent., \$1,200 at  $7\frac{1}{2}$ , and \$1,000 at 6; find the percentage he receives on the average.

9. A mortgage for \$1,000, paying 7 per cent. per annum, payable yearly, has two years to run; what should a loan society give for the mortgage that it may receive 8 per cent. on its investment, it being assumed that all moneys received by the society can be lent out at 8 per cent.?