

## JULY EXAMINATIONS 1882.

### INTERMEDIATE.

1. The fore and hind wheels of a carriage are 9 and 12 feet in circumference respectively. There are two points, one in each circumference, at present in contact with the ground. Shew that as the carriage moves on these points can never at the same time be the highest points of each wheel.

2. Reduce  $\left\{ \frac{5\frac{1}{2} - \frac{1}{4} \text{ of } 2\frac{7}{8}}{\frac{2}{3} \text{ of } 4\frac{1}{2} + 1\frac{1}{2}} - \frac{859}{1085} \right\}$  of 3 lbs. to the fraction of 5 tons.

3. Prove that  $.4873\bar{2}$  is equal to  $\frac{48684}{99900}$ .

4. Find the present value of \$320.00, due two years hence, at 8 per cent. per annum, compound interest.

5. Find approximately in how many years a given sum of money will double itself at 15 per cent. per annum, compound interest.

6. How large a bill of exchange on Paris can be bought for \$1500.00 currency, exchange being at the rate of \$1 for 5.25 francs, and gold being at a premium of  $8\frac{1}{2}$  per cent. ?

7. On July 10th a banker discounts a note for \$500.00, made May 10th, at six months, at the rate of 8 per cent. per annum. At what rate does he receive interest on his money?

8. A. sells an article at a certain advance per cent. on the cost to B., who, in turn, at the same advance per cent., disposes of it for \$19, finding that he had sold for \$13 he would have lost per cent.  $1\frac{1}{2}$  of what he now gains per cent. What did A. pay for the article?

9. Equal weights of gold and silver are in value as 20 to 1; and equal volumes are in value as 1284 to 35. A certain volume is composed of equal weights of gold and silver; find how many times more valuable the same volume would be were it composed wholly of gold.

10. The volume of a sphere is found by multiplying the cube of the radius by 4.1888; and the area of a circle by multiplying the square of the radius by 3.1416. Find the area of a circle which by rotating about a diameter will describe a sphere whose volume is one cubic foot.