all show 12 o'clock at the time of observation; the first is known to gain 10 minutes, and the second to lose 10 minutes every 12 hrs., while the third keeps accurate time; when will all the *minute* hands be next at 12 together?

5. How many ounces of coinage gold are equal in value to 112 ounces of coinage silver, 1869 sovereigns weighing 40 lbs. Troy, and 66 shillings weighing 1 lb. Troy?

6. Distinguish between bank discount and true discount. If the simple interest on a sum of money for a given time and rate is $\frac{1}{n}$ of the sum itself, show that the true discount is $\frac{1}{n+1}$ of that sum.

7. Reckoning commercial discount at 5%, a person would receive $44.52 less than the nominal value of a note which has a year to run; what should he receive for the note if true discount only were deducted?

8. What must a person have invested in Bank of Commerce stock at 120 and paying 4% half-yearly dividends, if a transfer of 65% of his capital to Dominion Bank stock, at 130 and paying 4½% half-yearly dividends, makes a difference of $5 in his semi-annual income?

9. A merchant in Montreal drew on Hamburg for 6,000 guilders at $.415; how much more would he have received if he had ordered remittance through London to Montreal, exchange at Hamburg on London being 11¼ guilders for £1, and at London on Montreal, 9¼, brokerage being 1¼% for remitting from London?

SOLUTIONS.

2. These quantities reduce to 1932, 1890 and 1035 pecks respectively; the L. C. M. of these is 86,940 pecks or 21,735 bushels.

3. $480 outlay bought 1,500 yards; therefore, what he receives for 220 yds. is the gain on 1500 yards, or what he receives for 11 yds. is the *gain* on 75 yds.; therefore, what he receives for 64 yds. must be the *cost* of 75 yds., so that in selling 64 yds. 11 yds. are gained, that is, $17\frac{3}{16}$ per cent.

4. The hands will be together when the first has gained and the second lost an hour; and this, at the rate of 10 minutes in 12 hours, will require 72 hours.

5. 12 oz. silver are worth 66s.
∴ 112 " " " 616s.
£1869 gold weigh 480 oz.
∴ £623 " " 160 oz.
623s. " " 8 oz.
616s. " " $7\frac{81}{89}$ oz.

6. If the interest is $\frac{1}{n}$ of the sum,
then $1 is the interest on $$n$.
∴ $ $(1+n)$ is the amt. of $$n$.
∴ $$n$ is the pres. w. of $ $(1+n)$,
∴ $1 is the disc. on $ $(1+n)$,
that is, the discount is $\frac{1}{1+n}$ of the sum.

7. 5% of the note is $44.52, ∴ whole note is $890.40 and the pres. w. of this for 1 yr. at 5% is $848.

8. The proceeds of 13 shares in the Commerce will purchase 12 shares in the Dominion. The income from this in the Commerce is $(14\times4=)$ 52; in Dominion $(12\times4\frac{1}{2}=)$ 54; hence by a transfer of 13 shares $2 are gained, and ∴ by 32½ shares $5 will be gained; but this is 65%, ∴ whole amount is 50 shares, that is, $5,000 stock or $6,000 invested.

9. If 1 guilder = $.415, 6,000 g.=$2,490; but 6,000 g.=£6,000÷11¼
$=\$6{,}000\div11\frac{1}{4}\times\frac{40}{9}\times1.09\frac{1}{4}\times\frac{100}{101\frac{1}{4}}$
=$2,557.65; ∴ gain is $67.65.