

High School Department

172D EXAMINATION

ADVANCED ARITHMETIC

Monday, January 27, 1902—9.15 a. m. to 12.15 p. m., only

Answer eight questions but no more. If more than eight are answered only the first eight answers will be considered. Give each step of solution. Express final result in its simplest form and mark it Ans. Each complete answer will receive $12\frac{1}{2}$ credits. Papers entitled to 75 or more credits will be accepted.

1 Find by division the greatest common divisor of 4718 and 2233. Give a demonstration of the process.

2 The sum of two numbers is 161 and their difference is 74; find the numbers and demonstrate the principle involved.

3 Divide .8487432 by .075637 and multiply the quotient by .835642; find the result correct to *three* decimal places, using the contracted methods of division and multiplication of decimals.

4 Find the weight in pounds of the oil contained in a cylindrical tank 1.5 meters in diameter and 1.8 meters high. [A kilogram equals $2\frac{1}{4}$ pounds and oil is .8 as heavy as water.]

5 Trade discounts of 10%, 10% and $x\%$ are equivalent to a direct discount of $23\frac{1}{2}\%$; find the value of x .

6 The areas of two spheres are to each other as 1 is to 2, the radius of the larger sphere is 5 inches; find the radius of the smaller sphere correct to *two* decimal places.

7 Insert *three* geometric means between the extremes $\frac{3}{4}$ and $\frac{2}{1875}$

8 An electric light is 4 times as intense as a gas light 15 feet from it; at what point between the two lights must an object be placed so as to be illuminated equally by the two lights? [The intensity of light varies inversely as the square of the distance from the source of illumination.]

9 When exchange is at 5.18, find the gain on 100 meters of silk bought in Paris @ 2 francs a meter and sold in New York @ 89¢ a yard, the duty being 60% ad valorem.

10 If $\frac{2}{3}$ of a ton of coal costs \$3.75, what will $\frac{3}{4}$ of a ton cost? Write the analysis in full.

11 Find the face of a sight draft that can be bought for \$585.80 when exchange is at a premium of $\frac{5}{8}\%$.

12 Washington is $77^\circ 3'$ west longitude and Pekin $116^\circ 29'$ east longitude; when it is 9.30 p. m., Tuesday, December 31, 1901 at Washington, what is the time of day, the day of the week and the date at Pekin?