642. How many gallons of water will a cistern hold which is 7 ft. long, 6 ft. wide, and 11 ft. deep?

643. A. can mow 2 acres in 3 days, and B. 5 acres in 6 days: in how many days can they together mow 9 acres?

644. A house valued at $3,240 is insured for $\frac{3}{5}$ of its value, at $\frac{3}{4}$ per cent.: what is the premium?

645. How many bricks will it require to build a wall 2 rd. long, 6 ft. high, and 18 in. thick, each brick being 8 in. long, 4 in. wide, and $2\frac{1}{2}$ in. thick?

646. If the wages of 24 men for 4 days are $192, what will be the wages of 36 men for 3 days?

(Solve by double proportion and cancellation.)

647. At what rate per cent. will $311.50 amount to $337.40 in 1 year. 4 mo.?

648. What will it cost to lay a pavement 36 ft. long, and 9 ft. 6 in. wide, at 40 cts. a sq. yd.?

Examination XXVIII. Nov. 4, 1875.

649. Express in words the number: 42567000129301.

650. Multiply five hundred and forty thousand six hundred and nine, by seventeen hundred and fifty.

651. Give the rule for reduction ascending (*i. e.* from lower to higher denominations), and state how this process chiefly differs from reduction descending.

652. How many steps of two and one-half feet each, would a man take in walking five miles?

653. How is a whole number reduced to a fraction of the same value, having a given denominator?

654. What is the value of $\frac{2}{3}$ of $\frac{3}{5}$ of $\frac{1}{4}$ of $\frac{1}{2}$, when reduced to a simple fraction of the lowest terms?

655. Give the rule for reducing several fractions to equivalent fractions, having the least common denominator.

656. Add $3\frac{3}{5}$, $4\frac{21}{38}$, and 51.652. (Express the fractional part of the sum as a *decimal* of three places.)

657. Write in figures: two and six hundred-millionths.

658. Reduce $\frac{7}{625}$ to the equivalent decimal form.

659. Multiply seven thousand and five, by three-hundred-and-five-millionths.

660. Divide .5 of 1.75 by .25 of $17\frac{1}{2}$.

661. If 27 T. 3 qr. 15 lb. of coal cost $217.83, what will 119 T. 1 qr. 10 lb. cost? (First reduce qrs. and lbs. to the decimal of a ton; and then solve by proportion.)

662. What is the square root of .0043046721 ?

663. The *ratio* of two numbers and the *consequent* being given, what is the process for finding the *antecedent* (considering it as standing in the same relation to the consequent, as a numerator to its denominator?)

664. Find the value of the omitted term in the following proportion : $4 : (?) :: 9 : 16.

665. A note for $486, dated Sept. 7, 1873, was endorsed as follows: Received, March 22, 1874, $125, May 13, 1875, $120. What balance remained due at time of last payment, the rate being 6 per cent ?

666. What is the length of the side of a cubical box which contains 103823 solid inches?

667. What are the proceeds of the following note discounted at *bank*, and *when will it become due?*

$100. UTICA, October 11, 1875.

Ninety days from date, for value received, I promise to pay to the order of John Smith, One Hundred Dollars, at the Albany City Bank. JOHN JAY.

668. Involve $\frac{5}{6}$ to the 5th power

669. Sold $9\frac{1}{6}$ cwt. sugar at $\$8\frac{1}{4}$ per cwt., and thereby lost 12 per cent: what was the first cost?

670. A person owned $\frac{5}{8}$ of a mine, and sold $\frac{2}{3}$ of his interest for $1710: what was the value of the entire mine?

671. When it is 2 h. 36′ A. M. at the Cape of Good Hope, in longitude 18° 24′ east, what is the time at Cape Horn, in longitude 67° 21′ west?

672. What is the cost of 17 T. 18 cwt. 1 qr. 17 lb. of potash, at $53.80 per ton? (First reduce the lower denominations to the decimal of a ton.)

Examination XXIX. Feb. 24, 1876.

673. Two men are 450 miles apart; if they approach each other, one traveling 30 miles a day and the other 35 miles a day, how far apart will they be at the end of 6 days?

674. A. had $24, B. four times as much as A. less $16, and C. twice as much as A. and B. together plus $17: how much money had C.?

675. Give all the prime numbers below 20; and all the composite numbers between 20 and 40 inclusive.