	(6.)						(7.)				
	yr.	mo.	da.	hr.			T.	cwt.	qr.	lb.	oz.	dr.
5)	32	3	18	18		8)	53	3	2	16	4	8

8. If 7 loads of wood contain 8 C. 6 C. ft., what will load contain?

9. What will be the weight of 1 tierce of rice, if 7 tierces weigh 1 ton 19 cwt. 2 qr. 12 lb.?

10. If 4 equal packages of medicines weigh 13 ℔ 7 ℨ 2 ℈ 1 ℈ 4 gr., what will be the weight of each.

11. How far will a man travel in 1 day, if in 5 days he travels 122 mi. 4 fur. 23¾ rd.?

12. If 9 equal fields contain 111 A. 2 R. 25 P., how much is there in each field?

13. If 9 equal pieces of calico contain 267 yd. 0 qr. 3 na., how much is there in each piece?

14. If a vessel running at an equal rate, sails 47 L. 1 mi. 7 fur. 8 rd., in 8 days, how far does she sail in 1 day?

15. If a steamer moves at the rate of 15 mi. 2 fur. 40 rd. per hour, what is the rate per minute?

16. A cartman carried 117 cords 110 feet of wood in 100 loads: how much did he carry at each load?

17. If a quantity of provisions will last one man for 2 weeks 6 days, how long will it last 50 men?

18. A person wishes to perform a journey of 165 mi. in 16 hours: at what rate must he travel?

19. How many suits of clothes, each requiring 7 yd. 2 qr., can be cut from a piece of cloth containing 67 yd. 2 qr.?

20. A ship has 468 T. 2 cwt. 2 qr. of railroad iron, and a wagon can carry 2 tons 3 cwt. 3 qr.: how many wagon-loads in the entire cargo?

ANALYSIS.

139. An ANALYSIS is an examination of the separate parts of a question, and of their connection with each other.

In analyzing, we reason from a *given number* to its *unit*, and then from this unit to the *required* number, or answer.

The processes are indicated by the relations which exist between the given and required numbers, and are pursued, step by step, independently of set rules.

CASE I.

140. To find the cost of several things, when the price of a single thing is an aliquot part of 1 dollar.

1. What is the cost of 75 yards of cotton cambric, at 33⅓ cents per yard?

ANALYSIS.—33⅓ cents = ⅓ of a dollar: 75 yards, at $1 a yard, would cost $75; at ⅓ of a dollar a yard, it would cost ⅓ of $75, which is $25: Hence,

OPERATION.

3) 7 5
―――
$2 5

Rule.

Take such a part of the number of things, as the price of a single thing is of $1.

Examples.

1. What is the cost of 200 yards of cambric, at 25 cents a yard?

2. What will be the cost of 300 pencils, at 12½ cents each?

3. What will be the cost of 150 tops, at 6¼ cents apiece?

4. What will 500 melons cost, at 5 cents apiece?

5. What will be the cost of 150 gallons of molasses, at 33⅓ cents per gallon?

CASE II.

141. To find the cost, when the price of 1, and the number of things are given.

1. What is the cost of 48 lemons, at 3 cents apiece?

ANALYSIS.—Since 1 lemon costs 3 cents, 48 lemons will cost 48 times 3 cents, or 3 times 48 cents, which is 144 cents: Hence,

OPERATION.

```
 4 8
   3
-------
$ 1 . 4 4
```

Rule.

Multiply the price of 1 by the number of things, or the number of things by the price of 1, and the product will be the cost.

Examples.

1. What will 75 hats cost, at $4.25 each?
2. If wheat is $1.60 a bushel, what will be the cost of 13.5 bushels?
3. What is the cost of 4204 yards of cloth, at $3.37½ a yard?
4. What will 3704 pair of shoes cost, at $2.75 a pair?
5. If 1 cheese costs $3.75, what will be the cost of 324?

CASE III.

142. To find the cost of things sold by the 100 or 1000.

1. What is the cost of 8781 feet of lumber, at $4 per hundred feet?

Rule.—*Multiply the number of things and price together, and point off in the product, two places of decimals more than there are in both factors, when sold by the hundred, and three places more, when sold by the thousand.*

OPERATION.

```
 8 7 8 1
       4
-----------
$ 3 5 1 . 2 4
```

Examples.

1. What will be the cost of 54704 bricks, at 50 cents per hundred?
2. What will 1347 feet of lumber cost, at $2.25 per C?
3. What will be the cost of 15758 feet of boards, at $10.62 per M?
4. What is the value of 57046 feet of lathing, at $7 per M?
5. What will be the value of 560 chickens, at $33 per C?
6. What is the value of 4704 pounds of butter, at $23 per hundred?

CASE IV.

143. To find the cost of articles sold by the ton of 2000 pounds, when the price of a ton is known.

1. What is the cost of 6528 pounds of hay, at $18.50 per ton?

Rule.—*Divide the price by 2, and then find the cost of the quantity by the last Case.*

OPERATION.

```
2 ) 1 8 . 5 0
--------------
 $ 9 . 2 5
```

Examples.

1. What will 57045 pounds of plaster cost, at $4.25 per ton?
2. What is the cost of transportation of 87415 pounds of iron from Buffalo to New York, at $7 per ton?
3. What is the cost of 75049 pounds of coal, at $7.75 per ton?
4. What is the cost of transporting 785674 pounds of coal from Albany to Boston, at $2.70 per ton?

CASE V.

144. When the number of things is known, and their cost, to find the price of 1 thing.

1. If 36 pounds of tea cost $52.20, what is the price per pound ?

ANALYSIS.—1 pound will cost one thirty-sixth as much as 36 pounds; one thirty-sixth of $52.20 is $1.45: therefore, 1 pound will cost $1.45.

OPERATION.

```
3 6 ) 5 2.2 0 ( 1.4 5
      3 6
      ―――
      1 6 2
      1 4 4
      ―――
        1 8 0
        1 8 0
```

Rule.—*Divide the entire cost by the number of things.*

Examples.

1. Divide 1884.625 into 25 equal parts.

2. A farmer purchased 758 sheep for $3750 : how much did he pay per head ?

3. A merchant bought 30 bales of goods, for which he paid $2000 : what did they cost him per bale ?

4. A drover paid $2500 for 400 sheep : what must he sell them for apiece, that he may neither make nor lose ?

CASE VI.

145. **When the cost of a number of things is given, and the price of 1, to find the number.**

1. If I pay $6.50 for a ton of coal, how much can I buy for $97.50 ?

ANALYSIS.—As many tons as $6.50 is contained times in $97.50, which is 15.

OPERATION.

```
6.5 0 ) 9 7.5 0 ( 1 5  tons.
        6 5 0
        ―――
        3 2 5 0
        3 2 5 0
```

Rule.—*Divide the entire cost by the cost of 1 thing.*

Examples.

1. If 1 acre of land costs $77.50, how much can be bought for $27125 ?

2. How many sheep will $396 buy, at $4.12½ each ?

3. At $4.25 a yard, how much cloth can be bought for $136 ?

RATIO AND PROPORTION.

146. A RATIO is the quotient obtained by dividing one number by another.

147. The terms of a ratio are the divisor and dividend : hence, every ratio has two terms.

148. The divisor is called the ANTECEDENT.

149. The dividend is called the CONSEQUENT.

150. The ratio of one number to another is generally expressed by a colon ; thus, 3 : 12 ; and is read, 3 is to 12, or 12 divided by 3.

151. The terms of a ratio, taken together, are called a COUPLET.

Examples.

1. What is the ratio of 2 feet to 8 feet ?

2. What is the ratio of 4 yards to 12 yards ?

3. What is the ratio of 6 to 18 ?

4. What is the ratio of 9 to 27 ?

5. What is the ratio of 12 to 48 ?

6. What is the ratio of 1 to 15 ?

7. What is the ratio of 10 to 100 ?

8. If the antecedent is 6 and the consequent 12, what is the ratio ?

9. If the antecedent is 9, and the consequent 18, what is the ratio ?

10. If the consequent is 16, and the antecedent 2, what is the ratio ?

11. If the consequent is 24, and the antecedent 12, what is the ratio ?