

51. Write as a common fraction and as a decimal: $\frac{3}{4}\%$; $\frac{1}{10}\%$; $7\frac{1}{2}\%$; 340% ; 40% ; 4% ; $14\frac{3}{4}\%$; 625% .

52. A horse worth \$150 was bought for \$25 less and sold for \$25 more than his real value. What % was gained?

53. At \$5 a ton, how many tons of coal can be bought with \$8526, after paying commission of $1\frac{1}{2}\%$?

54. Which is a greater per cent. change, when sugar drops from 6 to 5 cents a pound, or when it advances from 5 to 6 cents? Why?

55. If the cost is $\frac{2}{3}$ of the selling price, find the gain %.

56. If the selling price is $\frac{2}{3}$ of the cost, find the loss %.

57. Bought 320 shares of a certain stock (par \$10) when $3\frac{1}{2}\%$ below par, and sold them when $1\frac{3}{4}\%$ above par. Find my gain in dollars and in per cent.

58. Bought 500 shares of railroad stock at $28\frac{1}{2}$ and sold it at $45\frac{3}{4}$. Allowing $\frac{1}{2}\%$ commission on both purchase and sale, what was my gain?

59. Sold 400 shares of United States Steel preferred, at $98\frac{1}{4}$. With the proceeds I bought 1000 shares of Southern Railway at $31\frac{3}{8}$. Allowing $\frac{1}{2}\%$ commission in each transaction, how much money remained unemployed?

60. Mr. A. sold 800 Reading bonds (4%) at $96\frac{3}{4}$ and bought Erie at 51. How many shares did he buy, allowing commission on bonds at $\frac{1}{4}\%$ and on stock at $\frac{1}{2}\%$?

61. I sent my broker \$10000, asking him to buy some Southern Pacific R. R. stock under 45 and sell it over 60. He bought all he could with my remittance at $42\frac{3}{4}$ and sold it at $60\frac{1}{2}$. Compute the number of shares purchased; his total commission at $\frac{1}{2}\%$; and my profit.

62. In a certain school there are 288 boys and 162 girls. What per cent. of the school is boys? Girls?

63. Into 80 gallons of alcohol are mixed 40 gallons of water. What per cent. of the mixture is water?

64. To bake a certain kind of bread 9 measures of rye meal are mixed with 13 measures of corn meal. What per cent. of the bread is rye?

65. After a reduction of 8% a man's wages were \$22.54. What were they before the reduction?

66. What amount of insurance may I procure on my house by paying \$35 if the rate is $\frac{3}{8}\%$?

67. Twenty per cent. of the selling price of my horse was \$36. What was my profit if I gained 20%?

68. In a certain city there are 73000 white, and 25000 black citizens. What per cent. of the entire population is colored?

69. Sold two horses for \$210 each. On one I gained 20% and on the other I gained \$20. Find my total gain. Also gain per centum.

CHAPTER XV.

INTEREST.

256. Interest.—If a business man does not have money enough of his own to carry on a certain enterprise, he may be enabled to proceed, by borrowing money from another person. In such cases it is customary to pay a certain sum (per annum) in return for the use of the borrowed money.

As money paid for the use of a house is called *rent*, and money paid for the use of a horse is called *hire*, so money paid for the use of money is called *interest*.

Interest is usually reckoned as a certain annual per cent. of the money borrowed.

257. Interest and Time.—The length of time for which borrowed money is used varies greatly according to the needs of the borrower. The time may be only a few days, or it may be a number of years, or of years, months, and days.

Hence, interest differs from percentage in general, in that the element of *time* is to be carefully considered in connection with every problem.

258. The quantities considered in interest are the *principal*, *rate*, *interest*, *time*, *amount*.

The *principal* is the sum of money on which interest is paid.

The *rate* is the per cent. of the principal paid for the use of the principal for one year.

The *interest* is the sum of money paid for the use of the principal for the entire time.

The *amount* is the sum obtained by adding the interest to the principal.

259. Legal interest is interest determined according to a

rate fixed by law. In business transactions, when no rate is specified, the legal rate is understood.

Usury is interest at a rate higher than that fixed by law. The exaction of usury is punishable by law.

Different states and nations have different legal rates of interest, according to their financial needs.

In 1900 the legal rate was 6% in all the states, with the following exceptions: 5% in La. and Ill.; 7% in Ariz., Cal., Ga., Idaho, Minn., Neb., Nev., N. Dak., Okla., S. C., S. Dak., and Wash.; 8% in Ala., Colo., Fla. Ore., Utah, Wyo.; 10% in Mont.

In many of the states the law allows a higher rate than the legal one to be used by mutual agreement.

260. Methods of Computing Interest.—Persons who have many problems in interest to compute (as, for instance, bankers) do so by the use of tables. Other methods, however, are needed for persons to whom tables are not accessible, and to give mastery of other problems related to interest. Of the many methods by which interest can be computed, three principal ones (beside the use of tables) will be considered here, another being presented later in connection with the subject of discount.

I. WHEN THE TIME IS AN EXACT NUMBER OF YEARS OR MONTHS.

261. Method.—When the period of time for which interest is to be computed is an exact number of years, or years and months, find the interest for one year and multiply this by the number of years.

Ex. What is the interest on \$350 for 2 years 3 months, at 5%?

OPERATION.	EXPLANATION.
2 yr. 3 mo. = $2\frac{1}{4}$ yr.	
\$350	Since 3 mo. = $\frac{1}{4}$ yr., the entire
.05	time is $2\frac{1}{4}$ yr. Since 5% of \$350
\$17.50, Interest for 1 year.	is \$17.50, the interest for 1 yr. is
<u>21</u>	\$17.50. Hence, the interest for
3500	$2\frac{1}{4}$ yr. is $2\frac{1}{4}$ times \$17.50, or \$39.38.
437 $\frac{1}{2}$	
\$39.38, Interest for 2 yr. 3 mo.	

EXERCISE 126.

Find the interest of

1. \$340 for 4 yr. 6 mo. at 5%.
2. \$275 for 3 yr. 8 mo. at 6%.
3. \$515 for 5 yr. 4 mo. at $4\frac{1}{2}$ %.
4. \$108.50 for 6 yr. at 3%.
5. \$214.61 for 8 yr. 6 mo. at 5%.
6. \$2075 for 10 yr. 2 mo. at 6%.
7. \$489.30 for 2 yr. 5 mo. at 7%.
8. \$307.15 for 9 mo. at $2\frac{1}{2}$ %.
9. \$2560.60 for 7 yr. 11 mo. at $3\frac{1}{2}$ %.
10. \$1971.40 for 10 mo. at $5\frac{1}{2}$ %.
11. \$7327.50 for 3 yr. 8 mo. at 6%.
12. \$956.70 for 5 yr. 6 mo. at $4\frac{1}{2}$ %.

EXERCISE 127.

ORAL.

What is the interest of

1. \$3 for 4 yr. at 6%? At 2%? At 5%?
2. \$8 for 1 yr. 6 mo. at 5%? At 3%?
3. \$9 for 2 yr. 4 mo. at 3%? At 4%?
4. \$10 for 3 yr. 3 mo. at 4%? At 6%?
5. \$15 for 5 yr. 8 mo. at 2%? At 5%?
6. \$100 for 6 yr. 9 mo. at 5%? At 6%?

II. SIX PER CENT. METHOD.

262. The six per cent. method of finding interest consists essentially in finding

- (1) the interest on \$1 for the given time at 6%,
- (2) the interest on the entire principal for the given time at 6%,
- (3) the interest on the entire principal at any other desired rate.

The interest on \$1 for the required time at 6% is readily obtained by the use of the following:

Interest on \$1 for 1 year	=	\$0.06.
“ “ \$1 “ 1 mo.	=	.005.
“ “ \$1 “ 6 da.	=	.001.
“ “ \$1 “ 1 da.	=	.000 $\frac{1}{6}$.

Hence, in computing interest according to this method, each month is considered as containing 30 days, and 1 year as containing 360 days.

Ex. 1. Find the interest on \$312 for 2 yr. 7 mo. 15 da. at 6%.

SOLUTION.

Interest on \$1 for 2 yr.	=	$\$0.06 \times 2$	=	$\$0.12.$
“ “ \$1 “ 7 mo.	=	$\$0.005 \times 7$	=	.035.
“ “ \$1 “ 15 da.	=	$\$0.000\frac{1}{6} \times 15$	=	.0025.
“ “ \$1 “ 2 yr. 7 mo. 15 da.	=		=	.1575.
Interest on \$312 “ “ “ “	=	$\$312 \times .1575.$		

\$312
.1575
1560
2184
1560
312
\$49.1400, Interest.

Ex. 2. Find interest on \$312 for 2 yr. 7 mo. 15 da. at 5%.

SOLUTION.

By Ex. 1, the interest on \$312 for the given time at 6% =	\$49.14.
Hence, “ “ “ “ “ “ “ “ 1% =	8.19.
“ “ “ “ “ “ “ “ 5% =	\$40.95.

Ex. 3. Find the interest on \$317.25 from Apr. 1, 1892, to Nov. 19, 1896, at 4 $\frac{1}{2}$ %.

SOLUTION.

From Apr. 1, '92, to Nov. 19, '96, is	4 yr. 7 mo. 18 da.
Interest on \$1 for 4 yr. 7 mo. 18 da. at 6%	= \$0.278.
Interest on \$317.25 for 4 yr. 7 mo. 18 da. at 6%	= $\$0.278 \times 317.25 = \$88.20.$
“ “ \$317.25 “ “ “ “ “ “ “ “ 1 $\frac{1}{2}$ %	= \$22.05.
“ “ \$317.25 “ “ “ “ “ “ “ “ 4 $\frac{1}{2}$ %	= \$66.15, Result.

Hence, in general, obtain the interest on \$1 for the given time, by multiplying the number of years by .06, the number of months by .005, and the number of days by .000 $\frac{1}{6}$, and taking the sum of the results; multiply the number of dollars in the principal by the interest on \$1; this will give the interest at 6%; to obtain the interest at any other rate, add or subtract such a fractional part of this interest, as the rate exceeds or falls below 6%, or find the interest at 1% and multiply it by the required rate.

The first part of this method, sometimes stated in other ways, as reduce the years to months, take the number of months as cents, one-third the number of days as mills, and multiply their sum by half the principal; or multiply dollars by days and divide by 6000.

EXERCISE 128.

Find the interest, by the 6% method, of:

- \$260 for 2 yr. 8 mo. 24 da. at 6%.
- \$450 for 4 yr. 6 mo. 15 da. at 4%.
- \$846 for 7 yr. 10 mo. 12 da. at 5%.
- \$2350 for 5 yr. 9 mo. 6 da. at 3%.
- \$246.70 for 6 yr. 1 mo. 20 da. at 4 $\frac{1}{2}$ %.
- \$93.45 for 3 yr. 11 mo. 3 da. at 7%.
- \$928.50 for 8 yr. 3 mo. 25 da. at 8%.
- \$1250.40 for 10 yr. 10 da. at 3 $\frac{1}{2}$ %.
- \$760 from July 4, 1875, to Feb. 22, 1890, at 4%.
- \$45.50 from Oct. 19, 1890, to Mar. 11, 1899, at 5%.
- \$325.60 from Nov. 8, 1888, to June 23, 1897, at 3%.
- \$50.60 from Dec. 25, 1789, to May 1, 1801, at 6%.
- \$2500 from Aug. 17, 1903, to Nov. 8, 1930, at 5%.
- \$3280 from July 4, 1776, to Jan. 3, 1850, at 4 $\frac{1}{2}$ %.
- \$7650 from Sept. 10, 1888, to Oct. 1, 1900, at 7%.
- \$372 from Oct. 12, 1492, to to-day at 5%.
- \$9800 for 8 yr. 3 mo. 26 da. at 3 $\frac{1}{2}$ %.
- \$7384.80 for 9 yr. 2 mo. 10 da. at 5 $\frac{1}{2}$ %.
- \$12.75 for 7 yr. 18 da. at 6 $\frac{1}{2}$ %.
- \$5.64 for 3 yr. 8 mo. 20 da. at 3 $\frac{1}{2}$ %.

III. EXACT INTEREST.

263. Exact interest is interest obtained by taking one year as equal to 365 days.

The U. S. Government computes interest by the exact method, as do also an increasing number of business men.

Ex. Find the exact interest on \$652 from Apr. 1, 1895, to Sept. 13, 1897, at 7%.

SOLUTION.

From Apr. 1, '95, to Apr. 1, '97, is 2 years.

From Apr. 1, '97, to Sept. 13, '97, is 165 days.

165 days = $\frac{165}{365}$ yr. = $\frac{33}{73}$ of a year.

Interest on \$652 at 7% for 1 year = \$45.64.

Interest on \$652 at 7% for $2\frac{33}{73}$ years = $\$45.64 \times 2\frac{33}{73} = \111.91 , Interest.

EXERCISE 129.

Find the exact interest of:

1. \$400 for 146 days at 7%.
2. \$325 for 3 yr. 219 da. at 4%.
3. \$75.50 for 2 yr. 100 da. at 5%.
4. \$136.40 for 4 yr. 150 da. at $4\frac{1}{2}$ %.
5. \$350 from Jan. 10, 1890, to Dec. 1, 1894, at 5%.
6. \$425 from May 16, 1887, to Jan. 4, 1895, at 6%.
7. \$170 from Feb. 20, 1900, to Oct. 16, 1906, at 6%.
8. \$90.50 from July 7, 1891, to Mar. 3, 1899, at 4%.
9. Find the difference between the exact interest and the interest determined by the 6% method, on \$7000 from Mar. 11 to Sept. 10, at 6%.
10. Find the difference between the exact interest and the interest found by the 6% method, on \$4500 from Nov. 16, 1889, to June 23, 1897, at 5%.
11. Find the difference between the two interests of \$5678000 from Jan. 10 to July 10 of same yr., at 7%.
12. When the time is less than a year and in days, what will always be the ratio between these two interests?

IV. INTEREST TABLES.

264. If interest tables are available, the most convenient way of computing interest is by their use. In some cases the tables are formed regarding a year as 360 days; other tables give exact interest. In either case the exact number of days is reckoned between two dates in computing any problem in interest.

A part of a page from an interest table is inserted below. It gives the exact interest on various sums from \$10 to \$150 at 1, 5, 6, 7% for 60 and 61 days.

Dolls.	60 days				61 days			
	7	6	5	1	7	6	5	1
10	.1151	.0986	.0822	.0164	.1170	.1003	.0836	.0167
20	.2301	.1973	.1644	.0329	.2340	.2005	.1671	.0334
30	.3452	.2959	.2466	.0493	.3510	.3008	.2507	.0501
40	.4603	.3945	.3288	.0658	.4679	.4011	.3342	.0668
50	.5753	.4931	.4110	.0822	.5849	.5014	.4178	.0836
60	.6904	.5918	.4931	.0986	.7019	.6016	.5014	.1003
70	.8055	.6904	.5753	.1151	.8189	.7019	.5849	.1170
80	.9205	.7890	.6575	.1315	.9359	.8022	.6685	.1337
90	1.0356	.8877	.7397	.1479	1.0529	.9025	.7520	.1504
100	1.1507	.9863	.8219	.1644	1.1699	1.0027	.8356	.1671
110	1.2657	1.0849	.9041	.1808	1.2868	1.1030	.9192	.1833
120	1.3808	1.1836	.9863	.1973	1.4038	1.2033	1.0027	.2005
130	1.4959	1.2822	1.0685	.2137	1.5208	1.3035	1.0863	.2173
140	1.6109	1.3808	1.1507	.2301	1.6378	1.4038	1.1699	.2340
150	1.7260	1.4794	1.2329	.2466	1.7548	1.5041	1.2534	.2507
Etc.

Ex. Find exact interest on \$146.50 at 5% for 60 days by the use of tables.

SOLUTION.

Interest on \$140 for 60 days at 5%	=	\$1.1507
" " 6 (= $\frac{1}{10}$ of \$60) for 60 days at 5%	=	.0493
" " .50 (= $\frac{1}{10}$ of \$50) for 60 days at 5%	=	.0041
		\$1.2041,
		or \$1.20, Interest.

PROBLEMS IN INTEREST.

Any three of the five quantities considered in interest, the *principal*, *rate*, *interest*, *time*, *amount*, being given, the other two may be found. The case when the principal, rate, and time are given, to find the interest (and amount) has already been considered.

265. I. Given the principal, interest (or amount), and time, to find the rate per cent. The method is best shown by an example.

Ex. 1. At what rate per cent. will \$360 produce \$66 interest in 3 yr. 8 mo?

SOLUTION.

Interest on \$360 for 1 yr. at 1%	=	\$3.60.
" " \$360 " 3 yr. 8 mo. at 1%	=	\$3.60 \times 3 $\frac{2}{3}$ = \$13.20.

If the given principal produces \$13.20 interest in the given time at 1%, it will take as many per cent. to produce \$66 as \$13.20 is contained times in \$66.

$$\text{Rate required} = \frac{\$66}{\$13.20} = 5, \text{ Rate.}$$

Ex. 2. At what rate per cent. will \$120 amount to \$144 in 5 years?

The interest = amount - principal = \$144 - \$120 = \$24. Proceeding as in Ex. 1.

\$120
.01
\$1.20
5
\$6.00
\$24.00(4, Rate.
24.00

Hence, in general, divide the given interest by the interest on the principal for the given time at one per cent.

It is useful also to state this rule briefly, thus:

$$\text{rate} = \text{interest} \div (\text{principal} \times .01 \times \text{time}),$$

$$\text{or using symbols, } r = \frac{i}{p \times t},$$

where r denotes the rate per cent. expressed decimally.

EXERCISE 130.

Find the rate if:

1. Interest on \$420 for 3 yr. 6 mo. is \$73.50.
2. Interest on \$56 for 4 yr. 3 mo. is \$9.52.
3. Interest on \$760 for 2 yr. 8 mo. is \$121.60.
4. Interest on \$840 for 5 yr. 3 mo. 15 da. is \$311.15.
5. Interest on \$900 for 2 yr. 4 mo. 20 da. is \$96.75.
6. Interest on \$45 for 3 yr. 9 mo. 24 da. is \$10.305.
7. Interest on \$370 for 6 yr. 6 mo. 6 da. is \$72.335.
8. Interest on \$49.50 for 1 yr. 4 mo. 10 da. is \$2.695.
9. Interest on \$1780 for 6 mo. 25 da. is \$55.748.
10. Interest on \$100 for 16 yr. 8 mo. is \$100.
11. Amount of \$360 in 3 yr. 10 mo. is \$415.20.
12. Amount of \$3700 in 2 yr. 7 mo. is \$4225.71.
13. Amount of \$75 in 6 yr. 11 mo. 10 da. is \$93.23.

266. II. Given the principal, interest (or amount), and rate, to find the time.

Ex. In what time will the interest on \$424 be \$37.10 at 2 $\frac{1}{2}$ %?

SOLUTION.

Interest on \$424 at 2 $\frac{1}{2}$ % for 1 year = \$10.60.

Hence, it will take as many years to produce \$37.10 interest as \$10.60 is contained times in \$37.10.

$$\therefore \text{Number of years} = \frac{\$37.10}{\$10.60} = 3\frac{1}{2}. \therefore \text{Time} = 3 \text{ yr. } 6 \text{ mo.}$$

Hence, in general, divide the given interest by the interest of the principal at the given rate for one year;

or time = interest \div (principal \times rate expressed decimally),

$$\text{or using symbols, } t = \frac{i}{p \times r}$$

EXERCISE 131.

Find the time if:

1. Interest on \$75 at 6% is \$15.75.
2. Interest on \$240 at 5% is \$63.
3. Interest on \$475 at 4% is \$33.25.
4. Interest on \$76.80 at $4\frac{1}{2}\%$ is \$9.792.
5. Interest on \$570 at 7% is \$332.50.
6. Interest on \$65 at 6% is \$12.514.
7. Interest on \$820 at 3% is \$140.77.
8. Interest on \$980 at $3\frac{1}{2}\%$ is \$259.54.
9. Amount of \$420.75 at 4% is \$475.915.
10. Amount of \$31250 at 5% is \$35625.
11. Amount of \$8.25 at 6% is \$13.134.
12. Amount of \$2460 at $5\frac{1}{2}\%$ is \$3224.82.

267. III. Given the interest (or amount), time, and rate, to find the principal.

Ex. 1. What principal will produce \$33.75 interest in 2 yr. 3 mo. at 6%?

SOLUTION.

Interest on \$1 for $2\frac{1}{4}$ yr. at 6% = \$0.135.

If one dollar produces \$0.135 interest in the given time, it will take as many dollars to produce \$33.75 interest as \$0.135 is contained times in \$33.75, or

$$\frac{\$33.75}{\$0.135} = 250. \therefore \text{Principal} = \$250.$$

Hence, in general, divide the given interest (or amount) by the interest on (or amount of) \$1 for the given time and rate,

$$\text{or principal} = \text{interest} \div (\text{time} \times \text{rate expressed decimally}), \text{ or } p = \frac{i}{r \times t}$$

It is to be noted that if the amount be given instead of the interest, it is necessary to divide the given amount by the amount of \$1 for the given time and rate.

Ex. 2. What principal will amount to \$263.50 in 4 years at 6%?

SOLUTION.

Amount of \$1 at 6% in 4 years = \$1.24.

It will take as many dollars to amount to \$263.50 as \$1.24 is contained times in \$263.50, or

$$\frac{\$263.50}{\$1.24} = 212.50. \therefore \text{Principal} = \$212.50.$$

EXERCISE 132.

What principal will:

1. Produce \$156.40 interest in 5 yr. 8 mo. at 6%?
2. Produce \$30.38 interest in 7 yr. 9 mo. at 5%?
3. Produce \$7.15 interest in 3 yr. 3 mo. at 4%?
4. Produce \$36.72 interest in 2 yr. 10 mo. at $4\frac{1}{2}\%$?
5. Produce \$83.72 interest in 6 yr. 8 mo. 15 da. at 3%?
6. Produce \$5.494 interest in 4 yr. 4 mo. 10 da. at 5%?
7. Amount to \$99.22 in 3 yr. 6 mo. at 6%?
8. Amount to \$195.09 in 5 yr. 9 mo. 20 da. at 5%?
9. Amount to \$121.98 in 4 yr. 8 mo. 24 da. at 6%?
10. Amount to \$327.384 in 7 yr. 4 mo. 12 da. at 7%?

268. The present worth of a sum payable at a future time (without interest) is such a sum, as being put at interest, will amount to the given sum in the given time.

The true discount is the difference between the sum payable at a future time and its present worth.

Hence, in determining the present worth of a sum due at a certain future date, we have given the amount, time, and rate, to find the principal (see Art. 267).

EXERCISE 133.

Find the present value and true discount upon:

1. A debt of \$378.75 due in 3 mo. without interest, but money being worth 4%.
2. A debt of \$4377.80 due in 6 mo. 15 da. without interest, but the usual rate being 6%.
3. A debt of \$8255 due in 1 yr. 8 mo. without interest, when the regular interest is at $3\frac{1}{2}\%$.

4. I owe you \$1492 payable in 8 mo. 20 da., not bearing interest. What sum ought you accept now if interest is reckoned at 5%?

269. General Algebraic Method.—For students who are familiar with the elements of algebra, all the problems in interest may be combined as the treatment of a single simple equation.

Thus, let p = principal, r = rate per cent. expressed decimally.
 i = interest, t = time expressed in years.

Then by the definition of interest, Art. 256 and by Art. 261,

$$i = prt \dots \dots \text{I.}$$

Any three of the four quantities, i , p , r , t , being given, the remaining quantity is found by solving equation I.

$$\text{Thus, divide I by } p \times t, r = \frac{i}{pt} \dots \dots \text{II.}$$

$$\text{" I " } p \times r, t = \frac{i}{pr} \dots \dots \text{III.}$$

$$\text{" I " } r \times t, p = \frac{i}{rt} \dots \dots \text{IV.}$$

Also letting a = amount,

$$a = p + prt = p(1 + rt)$$

$$\therefore p = \frac{a}{1 + rt}$$

EXERCISE 134.

GENERAL REVIEW.

1. At what rate will \$705.60 yield \$170.52 interest in 4 yr. 10 mo.?
2. What principal will produce \$14.30 interest in 3 yr. 8 mo. at 4%?
3. In what time will \$72.50 amount to \$113.64 $\frac{2}{3}$ at 6%?
4. If the rate is 4 $\frac{1}{2}$ %, the time 4 yr. 3 mo., and the amount \$123.89, find the principal.
5. If the principal is \$318, the rate 5%, and the amount \$422.675, find the time.
6. If the interest of \$441 is \$95.67 $\frac{1}{2}$ in 5 yr. 11 mo., find the rate.
7. What is the present worth of \$800, payable in 9 mo., money being worth 6%? 7%? 5%?
8. In 4 yr. 8 mo. a note I hold will be worth \$385.60. What ought I accept now, if money is worth 5%?

9. In what time will a sum of money double itself at simple interest, the rate being 4%? 5%? 6%? 7%? 8%?

10. In what time will \$126.50 yield \$6.66 interest at 4%?

11. At what rate will \$562 yield \$160.86 in 3 yr. 6 mo. 23 da.?

12. What principal will give \$207.71 interest in 1 yr. 6 mo. 17 da. at 5%?

13. What is the interest on \$963.45 from April 10, 1883, to July 4, 1895, at 2 $\frac{1}{2}$ %?

14. At what rate will \$250 gain \$35 in 2 yr. 9 mo. 18 da.?

15. Find the amount of \$392.10 for 6 yr. 9 mo. 15 da. at 3 $\frac{1}{4}$ %.

16. On an investment of \$5620 I receive \$1803 in 2 yr. 3 mo. 15 da. What is the rate?

17. In what time will \$2275 amount to \$2673.12 $\frac{1}{2}$ at 5%?

18. What principal will in 5 yr. 8 mo. 15 da., at 5%, give \$287.70?

19. At 6%, what sum of money will amount to \$666 in 6 yr. 6 mo. 6 da.?

20. In what time will \$500 produce \$50 interest at 3 $\frac{1}{2}$ %?