

## 11.2 - Personal Loans and Simple Interest

# VOCABULARY

## CREDIT or PRINCIPAL OF THE LOAN

The money the bank is willing to lend

## SECURITY or COLLATERAL

Anything of value pledged by the borrower that the lender can keep or sell should the borrower not repay the loan

## COSIGNERS

Signatures of other people who would become responsible for the loan in lieu of any collateral should the borrower fail to repay the loan

## PERSONAL NOTE

The document that states the terms and conditions of the loan.

## INTEREST

The money the borrower pays for the use of the lender's money

## SIMPLE INTEREST

Interest based on the amount of the loan for the total period of the loan

Interest = Principal x Rate x Time

$i = prt$ ; principal is the amount borrowed, rate is the interest expressed as a percent, and time is the number of days, months or years - NOTE: rate and time must have the same units!!!

## ORDINARY INTEREST

Simple interest where each month has 30 days and one year has 12 months or 360 days. Principal plus interest is due on the due date.

Example 1: Joe Johns needs to borrow \$1600 to have corrective eye surgery. From her credit union, she obtains a 9-month loan with an annual simple interest rate of 6.5%.

a) Calculate the simple interest on the loan.

$$i = Prt$$
$$(1600)(.065)\left(\frac{9}{12}\right) = 78$$

b) Calculate the amount that Joe will pay the credit union at the end of nine months.

$$1678$$

$$(P + I)$$

Example 2: Patricia Allen lent her friend Dan Marcus \$300 to help him pay his income taxes. Six months later Dan repaid Patricia \$315. What annual rate of interest did Patricia receive?

$$I = Prt$$
$$15 = (300)(r)\left(\frac{6}{12}\right)$$
$$15 = 150r$$
$$r = 10\%$$

Example 3: To obtain money for glasses, Gilbert pawns his trumpet. Gilbert borrows \$240 and after 35 days he pays back \$288. What annual rate of interest did Gilbert pay?

$$48 = 240(r)\left(\frac{35}{360}\right)$$
$$48.6\%$$

# VOCABULARY

## DISCOUNT NOTE

A type of loan where the interest is paid at the time the borrower receives the money

## BANK DISCOUNT

The interest charged in advance of the loan

\*\*Think of it this way - you ask to borrow \$30,000 and receive only \$27,000 - that is because the \$3,000 interest is paid out of the money you take out. You then are responsible for repaying the remaining \$27,000 interest free. This is how some student loans work.

Example 4: Jane Adams borrowed \$5000 on a 10% discount note for a period of three months. Find:  
a) The interest she must pay to the bank on the date she receives the loan. ~

$$\begin{aligned}i &= Prt \\ &= 5000(.10)\left(\frac{3}{12}\right) \\ &= \$125\end{aligned}$$

b) The net amount of money she receives from the bank.

$$\begin{aligned}5000 - 125 \\ \$4875\end{aligned}$$

★ Find the actual rate of interest for the loan.

$$\begin{aligned}i &= Prt \\ 125 &= (4875)r\left(\frac{3}{12}\right) \\ r &= 10.3\% \end{aligned}$$

# VOCABULARY

## DATE OF ORIGATION

The date at which time principal is given to the borrower

## DATE OF MATURITY

The date at which time principal and interest are due

## UNITED STATES RULE

The Supreme Court decision that specifies the method by which payments made before the date of maturity are credited. How it works:

Principal is given to the borrower

Borrower makes 1st pre - payment - this payment goes towards interest calculated from date of origination to date of payment then towards remaining principal.

Borrower makes 2nd pre - payment - this payment goes towards interest calculated from date of 1st payment to date of 2nd payment, then towards remaining principal.

This process repeats itself until date of maturity. The amount due on the date of maturity is the remaining principal plus the interest on just that principal compounded since the date of the last payment.

## BANKERS RULE

The rule used to calculate simple interest when applying the United States Rule. It considers one year to have 360 days, and any fractional part of a year is the exact number of days of the loan.



Days in Each Month												
	31	28	31	30	31	30	31	31	30	31	30	31
Day of Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Day 1	1	32	60	91	121	152	182	213	244	274	305	335
Day 2	2	33	61	92	122	153	183	214	245	275	306	336
Day 3	3	34	62	93	123	154	184	215	246	276	307	337
Day 4	4	35	63	94	124	155	185	216	247	277	308	338
Day 5	5	36	64	95	125	156	186	217	248	278	309	339
Day 6	6	37	65	96	126	157	187	218	249	279	310	340
Day 7	7	38	66	97	127	158	188	219	250	280	311	341
Day 8	8	39	67	98	128	159	189	220	251	281	312	342
Day 9	9	40	68	99	129	160	190	221	252	282	313	343
Day 10	10	41	69	100	130	161	191	222	253	283	314	344
Day 11	11	42	70	101	131	162	192	223	254	284	315	345
Day 12	12	43	71	102	132	163	193	224	255	285	316	346
Day 13	13	44	72	103	133	164	194	225	256	286	317	347
Day 14	14	45	73	104	134	165	195	226	257	287	318	348
Day 15	15	46	74	105	135	166	196	227	258	288	319	349
Day 16	16	47	75	106	136	167	197	228	259	289	320	350
Day 17	17	48	76	107	137	168	198	229	260	290	321	351
Day 18	18	49	77	108	138	169	199	230	261	291	322	352
Day 19	19	50	78	109	139	170	200	231	262	292	323	353
Day 20	20	51	79	110	140	171	201	232	263	293	324	354
Day 21	21	52	80	111	141	172	202	233	264	294	325	355
Day 22	22	53	81	112	142	173	203	234	265	295	326	356
Day 23	23	54	82	113	143	174	204	235	266	296	327	357
Day 24	24	55	83	114	144	175	205	236	267	297	328	358
Day 25	25	56	84	115	145	176	206	237	268	298	329	359
Day 26	26	57	85	116	146	177	207	238	269	299	330	360
Day 27	27	58	86	117	147	178	208	239	270	300	331	361
Day 28	28	59	87	118	148	179	209	240	271	301	332	362
Day 29	29	59	88	119	149	180	210	241	272	302	333	363
Day 30	30	59	89	120	150	181	211	242	273	303	334	364
Day 31	31	59	90	151	182	212	243	274	304	335	365	

Example 5: Determine the due date of a loan made on March 15 for 120 days.

74 + 120  
194  
July 13

Example 6: Determine the number of days from April 18 to July 31

212 - 108  
104

Example 7: Determine the simple interest, using the Banker's Rule, that will be paid on a \$300 loan at an interest rate of 5% for the period of March 3 to May 3.

$123 - 62$

$$i = prt$$

$$= (300)(.05)\left(\frac{61}{360}\right)$$

$$= \$2.54$$

Example 8: Cathy Johnson is a carpenter and plans to go to a conference. She takes out a \$400 loan on November 1, 2002 for 120 days at a rate of 12.5%. Cathy uses birthday gift money to make a payment of \$150 on January 3, 2003. She makes a second partial payment of \$100 on February 2, 2003.

a) What is the actual due date of the loan?

$$305 + 120 = 425 - 365 = 60 \text{ March 1}$$

b) What part of the January 3rd payment went towards interest? Principal?

$$i = (400)(.125)\left(\frac{63}{360}\right) = \$8.75 \quad I - 8.75$$

$$P - 141.25$$

c) What is the remaining balance after January 3rd?

$$\$258.75$$

d) What part of the February 2nd payment went towards interest? Principal?

$$i = (258.75)(.125)\left(\frac{30}{360}\right) = \$2.69 \quad I - 2.69$$

$$P - 97.31$$

e) What is the remaining balance after February 2nd?

$$258.75 - 97.31 = 161.44$$

f) What does Cathy owe on the date of maturity?

$$i = Prt$$

$$= (161.44)(.125)\left(\frac{27}{360}\right)$$

$$= \$1.51$$

$$\text{Due} = \$161.44 + 1.51$$

$$\boxed{\$162.95}$$

11/1 → \$400  
 1/3 → pay \$150  
 2/2 → pay \$100  
 3/1 → DUE

Nov 1 → 305  
       ↓ 40  
 Jan 3 → + 3  
       ———  
       63

3 } 30  
 33 }  
 60 }

27



