


PERCENTS AND INTEREST

Pre-Algebra



Review of Percents

Remember, almost all percent problems can be solved by translating the problem into a Percent Sentence Equation.

What is 5% of 16?

$$x = 0.05 \times 16$$



$$x = 9$$

Or, if a CD costs \$5 and there is a 6% discount, what is the discount?

____% of _____ is _____

(Original Price) (Discount)



$$0.06(5) = x$$

$$x = 0.30 \text{ or } 30 \text{ cents.}$$



Interest Problems

Interest problems are the one exception. Interest problems can not be solved using the percent sentence.

What are Interest Problems? Interest problems involve either borrowing or saving money. When you borrow money to buy a car, house, or any other big expense, YOU pay Interest. When you give money to a bank for a savings account, the bank pays YOU interest.

Interest

Interest is like "thank you" money. It is what is paid when you either borrow someone's money or they borrow your money.

If you let someone borrow \$100, you want your \$100 back. But you also want them to thank you or show appreciation for letting them use your money. That is Interest—"thank you" money.



Interest Formula

There are 3 things that affect Interest:

- How much money you loan them:
 - known as Principal (P).
- How long they borrow the money,
 - known as Time (T). **This is always expressed in terms of years.
- The rate in which the money is loaned...this is the percent part of the problem.
 - The Rate (R) is always a percent, but changed to a decimal when calculating the math part.



Interest Formula

- The formula is:



$$\text{Interest} = \text{Principal} \times \text{Rate} \times \text{Time}$$
$$I = PRT$$

- Principal (Amount borrowed/loaned)
- Rate (Percent)
- Time (in terms of years)
 - If the term is 6 months, you would use 0.5 (half a year)
 - If the term is 4 months, you would use 1/3





Interest Formula (cont.)
How to remember the Interest formula?

$I = PRT$
I am PRETTY





Interest Formula


Just like all other percent problems, don't forget to change the percent into a decimal first (move it 2 spaces to the left)!



Example

You want to buy your first car. You decide to take out a loan to buy a \$15,000 car. The bank gives you a 5% Interest Rate and says you have to pay the loan back in 5 years.






Example


What is the Formula?
 $I = PRT$

What is the Principal?
Amount Borrowed: \$15,000

What is the Rate?
5%--don't forget to change it to a decimal..0.05


What is the Time?
5 years (make sure it is always expressed in terms of years.)






Interest


So:
Interest = (15,000)(0.05)(5)
Interest = \$3750







Another Example

If you put in \$1,000 into a savings account and leave it there for 30 years and earn 7% interest rate, how much interest will you earn?





WORK

Formula: $I = PRT$
 P: \$1000
 R: 7% or 0.07
 T: 30 (years)
 $I = (1000)(0.07)(30)$
 I = 2100

Your Turn!

You decide you are going to buy a house, a nice \$250,000 farmhouse. The bank says it will give you a loan for 7% and they want their money back in 30 years. *How much will you end up paying for the house after you pay back the loan?*






WORK

I = PRT
 P: 250000
 R: 7% or 0.07
 T: 30 years

$I = (250000)(0.07)(30)$
 I = 525,000 (Yes, really!)

Answer: You will end up paying \$250,000 for the house AND \$525,000 in Interest. The house will then cost \$775,000 in the long run. (Yes, really!)

Key Points To Remember

The formula:

$$\text{Interest} = (\text{Principal})(\text{Rate})(\text{Time})$$

What is Principal?

The amount borrowed or loaned.

What is Rate?

The Percent---and change it to a decimal before multiplying

What is Time?

The amount in YEARS!!!