Warm Up

Problem of the Day

Lesson Presentation

Warm Up

1. What is 35 increased by 8%? 37.8

2. What is the percent of decrease from 144 to 120? $16\frac{2}{3}\%$

3. What is 1500 decreased by 75%? 375

4. What is the percent of increase from 0.32 to 0.64? 100%

Problem of the Day

Maggie is running for class president. A poll revealed that 40% of her classmates have decided to vote for her, 32% have decided to vote for her opponent, and 7 voters are undecided. If she needs 50% of the vote to win, how many of the undecided voters must vote for Maggie for her to win the election?

3

Learn to compute simple interest.

Vocabulary

interest

simple interest

principal

rate of interest

When you borrow money from a bank, you pay **interest** for the use of the bank's money. When you deposit money into a savings account, you are paid interest. **Simple interest** is one type of fee paid for the use of money.

Rate of interest is the percent charged or earned

Simple Interest

$$I = P \cdot r \cdot t$$

Principal is the amount of money borrowed or invested

Time that the money is borrowed or invested (in years)

Additional Example 1: Finding Interest and Total Payment on a Loan

To buy a car, Jessica borrowed $15,000 for 3 years at an annual simple interest rate of 9%. How much interest will she pay if she pays the entire loan off at the end of the third year? What is the total amount that she will repay?

First, find the interest she will pay.

$I = P \cdot r \cdot t$ *Use the formula.*

$I = 15{,}000 \cdot 0.09 \cdot 3$ *Substitute. Use 0.09 for 9%.*

$I = 4050$ *Solve for I.*

Additional Example 1 Continued

Jessica will pay $4050 in interest.

You can find the total amount **A** to be repaid on a loan by adding the principal **P** to the interest **I**.

$P + I = A$ *principal + interest = amount*

$15,000 + 4050 = A$ *Substitute.*

$19,050 = A$ *Solve for A.*

Jessica will repay a total of $19,050 on her loan.

Check It Out: Example 1

To buy a laptop computer, Elaine borrowed $2,000 for 3 years at an annual simple interest rate of 5%. How much interest will she pay if she pays the entire loan off at the end of the third year? What is the total amount that she will repay?

First, find the interest she will pay.

$I = P \cdot r \cdot t$ *Use the formula.*

$I = 2{,}000 \cdot 0.05 \cdot 3$ *Substitute. Use 0.05 for 5%.*

$I = 300$ *Solve for I.*

Check It Out: Example 1 Continued

Elaine will pay $300 in interest.

You can find the total amount **A** to be repaid on a loan by adding the principal **P** to the interest **I**.

$P + I = A$ *principal + interest = amount*

$2000 + 300 = A$ *Substitute.*

$2300 = A$ *Solve for A.*

Elaine will repay a total of $2300 on her loan.

Additional Example 2: Determining the Amount of Investment Time

Nancy invested $6000 in a bond at a yearly rate of 3%. She earned $450 in interest. How long was the money invested?

$I = P \cdot r \cdot t$ *Use the formula.*

$450 = 6{,}000 \cdot 0.03 \cdot t$ *Substitute values into the equation.*

$450 = 180t$

$2.5 = t$ *Solve for t.*

The money was invested for 2.5 years, or 2 years and 6 months.

Check It Out: Example 2

TJ invested $4000 in a bond at a yearly rate of 2%. He earned $200 in interest. How long was the money invested?

$I = P \cdot r \cdot t$ *Use the formula.*

$200 = 4{,}000 \cdot 0.02 \cdot t$ *Substitute values into the equation.*

$200 = 80t$

$2.5 = t$ *Solve for t.*

The money was invested for 2.5 years, or 2 years and 6 months.

Additional Example 3: Computing Total Savings

John's parents deposited $1000 into a savings account as a college fund when he was born. How much will John have in this account after 18 years at a yearly simple interest rate of 3.25%?

$I = P \cdot r \cdot t$ *Use the formula.*

$I = 1000 \cdot 0.0325 \cdot 18$ *Substitute. Use 0.0325 for 3.25%.*

$I = 585$ *Solve for I.*

Now you can find the total.

Additional Example 3 Continued

$P + I = A$ *Use the formula.*

$1000 + 585 = A$ *Substitute.*

$1585 = A$ *Solve for A.*

John will have $1585 in the account after 18 years.

Check It Out: Example 3

Bertha deposited $1000 into a retirement account when she was 18. How much will Bertha have in this account after 50 years at a yearly simple interest rate of 7.5%?

$I = P \cdot r \cdot t$ *Use the formula.*

$I = 1000 \cdot 0.075 \cdot 50$ *Substitute. Use 0.075 for 7.5%.*

$I = 3750$ *Solve for I.*

Now you can find the total.

Check It Out: Example 3 Continued

$$P + I = A$$ *Use the formula.*

$$1000 + 3750 = A$$ *Substitute.*

$$4750 = A$$ *Solve for A.*

Bertha will have $4750 in the account after 50 years.

Additional Example 4: Finding the Rate of Interest

Mr. Johnson borrowed $8000 for 4 years to make home improvements. If he repaid a total of $10,320, at what interest rate did he borrow the money?

$P + I = A$ *Use the formula.*

$8000 + I = 10,320$ *Substitute.*

$I = 10,320 - 8000 = 2320$ *Subtract 8000 from both sides.*

He paid $2320 in interest. Use the amount of interest to find the interest rate.

Additional Example 4 Continued

$I = P \cdot r \cdot t$ *Use the formula.*

$2320 = 8000 \cdot r \cdot 4$ *Substitute.*

$2320 = 32{,}000 \cdot r$ *Simplify.*

$\dfrac{2320}{32{,}000} = r$ *Divide both sides by 32,000.*

$0.0725 = r$

Mr. Johnson borrowed the money at an annual rate of 7.25%, or $7\dfrac{1}{4}$ %.

Check It Out: Example 4

Mr. Mogi borrowed $9000 for 10 years to make home improvements. If he repaid a total of $20,000 at what interest rate did he borrow the money?

$P + I = A$ *Use the formula.*

$9000 + I = 20,000$ *Substitute.*

$I = 20,000 - 9000 = 11,000$ *Subtract 9000 from both sides.*

He paid $11,000 in interest. Use the amount of interest to find the interest rate.

Check It Out: Example 4 Continued

$I = P \cdot r \cdot t$ *Use the formula.*

$11{,}000 = 9000 \cdot r \cdot 10$ *Substitute.*

$11{,}000 = 90{,}000 \cdot r$ *Simplify.*

$\dfrac{11{,}000}{90{,}000} = r$ *Divide both sides by 90,000.*

$0.1\overline{2} = r$

Mr. Mogi borrowed the money at an annual rate of about 12.2%.

Lesson Quiz: Part I

1. A bank is offering 2.5% simple interest on a savings account. If you deposit $5000, how much interest will you earn in one year? $125

2. Joshua borrowed $1000 from his friend and paid him back $1050 in six months. What simple annual interest did Joshua pay his friend? 10%

Lesson Quiz: Part II

3. The Hemmings borrowed $3000 for home improvements. They repaid the loan and $600 in simple interest four years later. What simple annual interest rate did they pay? 5%

4. Mr. Berry had $120,000 in a retirement account. The account paid 4.25% simple interest. How much money was in the account at the end of 10 years? $171,000