

TOPIC: APPLICATIONS OF PERCENT

Percent Change

◆ **Percent Change** is the _____ between two values measured as a percent of the _____ value.

► If the change is [**POSITIVE** | **NEGATIVE**], then we call it a percent [**INCREASE** | **DECREASE**].

EXAMPLE

If the price of an item was \$50 and is now \$60, find the percent change in price.

New

Percent Change

New Price: _____ Original Price: _____

Change in Price: = _____ = _____ = _____

Recall

$$\text{percent} = \frac{\text{partial amount}}{\text{whole amount}}$$

Percent [**INCREASE** | **DECREASE**]: _____

$$\text{percent change} = \frac{\text{amount}}{\text{amount}}$$

EXAMPLE

Due to illness the rabbit population in New Zealand changed from 12,000 in 2022 to 8,000 in 2023. Find the percent change in population.

New Population: _____ Original Population: _____ Change in Population: _____

Percent [**INCREASE** | **DECREASE**]: _____

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PRACTICE

Find the percent increase/decrease.

(**A**) A city's population grew from 120,000 to 138,000 people in one year. What is the percent increase in population?

(**B**) A smartphone originally costs \$800 but is now sold for \$680. Determine the percent decrease in price.

PRACTICE

Find the amount increase/decrease.

(**A**) Last season, a farmer harvested 500 kg of rice. Due to improved techniques, the harvest is estimated to increase by 20% this season. How much rice is the farmer looking to harvest this season?

(**B**) A reservoir's water level decreased by 20% over the summer due to evaporation. If the water level is currently at 120 million liters, how much water was there initially?

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Discount and Mark-up Problems

◆ A [**DISCOUNT** | **MARK UP**] is how much the price of an item [**DECREASES** | **INCREASES**].

► To solve, we apply the same strategy we use with percents.

EXAMPLE

(A) A used gaming system originally purchased for \$385 was sold at a garage sale at a discount of 85% the original price. What was the discount and new price?

Recall

partial amount = percent · whole amount

New

_____ = percent · _____

New price = original price _____

(B) An engagement ring was purchased at wholesale for \$1800. The retailer marked it up 70%. What was the mark up and new price?

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PRACTICE

(**A**) Ivy wants to buy a dress that originally costs \$120. The store is having a sale and offers \$35 off the original price. What is the sale price of the dress?

(**B**) There is a winter coat I've been eyeing that costs \$250. If it is bought in cash, I would receive a 20% discount. How much would I pay for that winter coat if I buy it in cash now?

PRACTICE

(**A**) A pair of running shoes costs \$80. The store is offering a 25% discount. Calculate the amount of discount and the sale price of the shoes.

(**B**) A smartphone originally costs \$800. It is on sale for \$680. Calculate the percent discount.

PRACTICE

(**A**) The bookstore buys a set of novels for \$120 and sells it for \$150. How much did they mark up?

(**B**) In a city, the water company increased the monthly water bill by 8%. The initial monthly cost is \$54. What is the cost after the increase?

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Simple Interest

◆ Recall: The formula $I = PRT$ means **Simple Interest** = **principal** · **rate** · **time**

► To solve simple interest problems, we apply our same strategy for solving problems with formulas.

EXAMPLE

Jenny borrowed \$1,275 from a local sponsor to fund a school science fair. The sponsor charges 6.8% simple interest per year. How much interest will Jenny owe after 4 years?

Recall

Solving Formulas

- 1) Identify known and unknown quantities
- 2) Plug in known quantities
- 3) Solve for unknown

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PRACTICE

(A) The student council borrowed \$1,275 from a local sponsor to organize a school event. The sponsor charges 6.5% simple interest per year. How much interest will the student council owe after a year?

(B) A community center paid \$432 in simple interest after 3 years on borrowed funds for new equipment. The interest rate was 4.5% per year. What was the original amount borrowed?

EXAMPLE

A bank loaned \$1,200 at 5% simple interest per year. What is the total amount to be repaid after 4 years?

PRACTICE

(A) A 10-year government bond paid 5.8% simple interest per year. Over the 10 years, the bond earned \$4,640 in interest. What was the principal of the bond?

(B) Sofia plans to buy a car. Her loan statement indicates she will pay \$1,350 in interest for a 3-year loan at 9% simple interest per year. How much did Sofia borrow for the car?