TOPIC: PERCENT PROBLEM SOLVING

Translating Percent Problems

◆ Recall: A **percent** is a part per 100 which can be written as a fraction (ratio) or decimal.

$$10\% = \frac{\quad}{100} =$$

▸ When solving problems with percents, *always* convert to _____ form.

New **Translate Percent Problems**

"A number is 10% of 50"

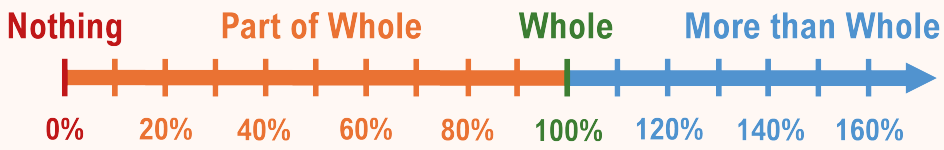
Recall
is → =
of → ·

Partial = Percent as decimal · Whole

EXAMPLE Translate & solve the percent problems below.

(***A***) 4 is 5% of what number?

(***B***) 35 is what percent of 28?



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EXAMPLE Translate & solve the percent problem below.

(***A***) A number is 50% of 18

(***B***) A number is 18% of 50

(***C***) Why are part (***A***) and (***B***) related?

EXAMPLE Caroline earns $3452 a month. She pays $1140 each month in rent. How much of her monthly paycheck goes towards rent?

PRACTICE Translate and solve the percent problems below.

(***A***) Saphia's lunch bill was $17.65. She wants to leave an 18% tip. How much should the tip be?

(***B***) Carson brought some new sneaker on sale for $250. The sale price was 65% of the original price. What was the original price?

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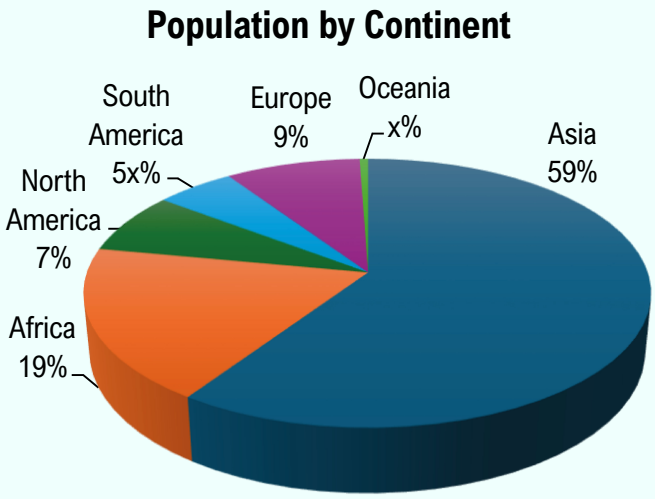
EXAMPLE The circle graph below shows the world population by continent. Use this graph to answer the questions below.

(***A***) What percent of people do not live in Asia?

(***B***) If the total world population is 8.142 billion people, how many people live in Africa?

(***C***) What percent of the world population lives in Oceania?

(***D***) What percent of the world population lives in South America?



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PRACTICE Solve the word problems below.

(***A***) If sales tax on a $36 pair of shoes is $1.26, find the sales tax on a $250 pair of shoes.

(***B***) Suppose the local sales tax rate is 6.5% and you buy a car for $12,500. What is the car's total cost?
Hint: Find how much tax is due first.

EXAMPLE

Laundry detergent costs $6.49 a pack. You have a coupon that gets you $1 off each pack if you purchase 3 packs. If sales tax is 7.5% how much will you be charged for purchasing 3 packs of laundry detergent using the coupon?

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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: = _____ = _____ = ____

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

Recall

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

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

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?

PRACTICE

A square garden has sides of 8 ft. The gardener reduces each side by 1 ft to make space for a pathway. What is the percent decrease in the perimeter of the garden?

TOPIC: PERCENT PROBLEM SOLVING

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***) 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***) A patient was prescribed a medication dose. It was increased by 15% after 3 days, and the new dosage is 23 cc. What was the original dosage?

(***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?