

Indicator 9 Class Notes by Mrs. Joshi

Ordering Percents and Fractions In Real World Situations

3. Use ratio and rate reasoning to solve mathematical and real-world problems (including but not limited to percent, measurement conversion, and equivalent ratios) using a variety of models, including tables of equivalent ratios, tape diagrams, double number lines, and equations.

4.4 Lesson

Check It Out
Lesson Tutorials
BigIdeasMath.com

Key Idea

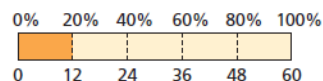
Finding the Percent of a Number

Words Write the percent as a fraction or decimal. Then multiply.

Numbers 20% of 60 is 12.

$$\begin{aligned} \frac{1}{5} \times 60 &= 12 \\ 0.2 \times 60 &= 12 \end{aligned}$$

Model



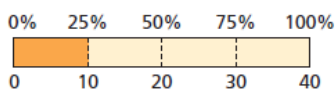
EXAMPLE 1 Finding the Percent of a Number

Use a fraction to find the percent of the number.

a. Find 25% of 40.

$$\begin{aligned} 25\% \text{ of } 40 &= \frac{1}{4} \times 40 \\ &= \frac{1 \times 40}{1 \cdot 4} \\ &= 10 \end{aligned}$$

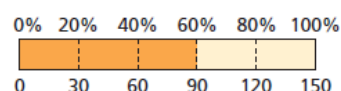
❖ So, 25% of 40 is 10.



b. Find 60% of 150.

$$\begin{aligned} 60\% \text{ of } 150 &= \frac{3}{5} \times 150 \\ &= \frac{3 \times 150}{1 \cdot 5} \\ &= 90 \end{aligned}$$

❖ So, 60% of 150 is 90.



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EXAMPLE 2 Standardized Test Practice



How many students went on vacation?

- (A) 48 (B) 96 (C) 100 (D) 104

From the survey, you can see that 48% out of 200 students said yes.

$$48\% \text{ of } 200 = 0.48 \times 200$$

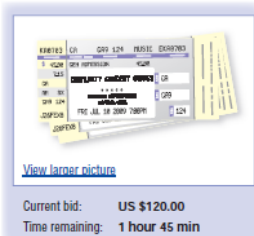
Write 48% as a decimal.

$$= 96$$

Multiply.

So, 96 students went on vacation. The correct answer is (B).

EXAMPLE 3 Using Mental Math



Your friend is bidding online for concert tickets. The current bid is shown. The winning bid is 150% of the current bid. How much is the winning bid?

Method 1: Write 150% as a decimal and multiply.

$$150\% \text{ of } 120 = 1.5 \times 120$$

$$= 180$$

Method 2: Using mental math, think 150% = 100% + 50%.

$$100\% \text{ of } 120 = 1 \times 120 = 120$$

$$50\% \text{ of } 120 = \frac{1}{2} \times 120 = 60$$

$$\text{Add: } 120 + 60 = 180$$

So, the winning bid is \$180.

EXAMPLE 4 Real-Life Application

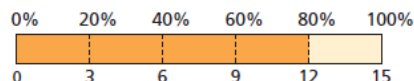
The width of a rectangular room is 80% of its length. What is the area of the room?

Find 80% of 15 feet.

$$80\% \text{ of } 15 = \frac{4}{5} \times 15$$

$$= \frac{4 \times \overset{3}{15}}{\underset{1}{5}}$$

$$= 12$$



The width is 12 feet.



15 ft

Use the formula for the area A of a rectangle.

$$A = 15 \times 12 = 180$$

So, the area of the room is 180 square feet.

TIME How many minutes is 40% of 2 hours?

LENGTH How many inches is 78% of 3 feet?

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4.3 Lesson

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When comparing and ordering fractions, decimals, and percents write the numbers as all fractions, all decimals, or all percents.

EXAMPLE 1 Comparing Fractions, Decimals, and Percents

- a. Which is greater, $\frac{3}{20}$ or 16%?

Study Tip

It is usually easier to order decimals or percents.

Write $\frac{3}{20}$ as a percent: $\frac{3}{20} = \frac{15}{100} = 15\%$

- ❖ 15% is less than 16%. So, 16% is the greater number.

- b. Which is greater, 79% or 0.08?

Write 79% as a decimal: $79\% = 79.\% = 0.79$

- ❖ 0.79 is greater than 0.08. So, 79% is the greater number.

EXAMPLE 2 Real-Life Application

You, your sister, and a friend each take the same number of shots at a soccer goal. You make 72% of your shots, your sister makes $\frac{19}{25}$ of her shots, and your friend makes 0.67 of his shots. Who made the fewest shots?

Remember

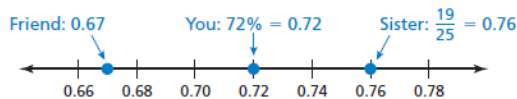
To order numbers from least to greatest, write them as they appear on a number line from left to right.

Write 72% and $\frac{19}{25}$ as decimals.

You: $72\% = 72.\% = 0.72$

Sister: $\frac{19}{25} = \frac{76}{100} = 0.76$

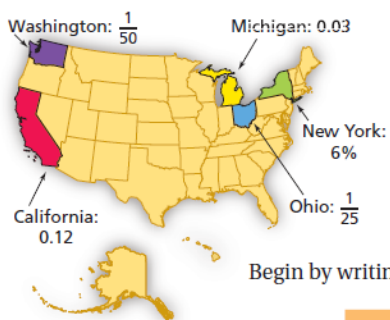
Graph the decimals on a number line.



- ❖ 0.67 is the least number. So, your friend made the fewest shots.

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EXAMPLE 3 Real-Life Application



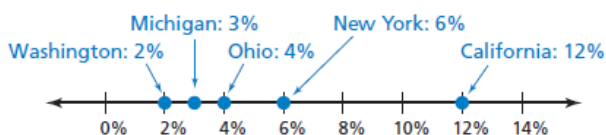
The map shows the portions of the U.S. population that live in five states.

List the five states in order by population from least to greatest.

Begin by writing each portion as a fraction, decimal, and percent.

State	Fraction	Decimal	Percent
Michigan	$\frac{3}{100}$	0.03	3%
New York	$\frac{6}{100}$	0.06	6%
Washington	$\frac{1}{50}$	0.02	2%
California	$\frac{12}{100}$	0.12	12%
Ohio	$\frac{1}{25}$	0.04	4%

Graph the percent for each state on a number line.



❖ The states in order from least to greatest are Washington, Michigan, Ohio, New York, and California.