

PERCENT

Lesson 3 The Percent One Number is of Another Number

1. CONVERTING DECIMALS TO PERCENTS

Before learning how to do this type of percent problem, you will need to know how to convert a decimal to a percent.

You just learned that to convert a percent to a decimal, you move the decimal point 2 places to the left and drop the % sign.

To convert a decimal to a percent, do the opposite:

- The rule is:**
1. move the decimal 2 places to the right
 2. add a % sign

Examples

Convert 0.25 to a percent.

$$0.25 \rightarrow \underset{\cup}{2} \underset{\cup}{5} \rightarrow 25\% \qquad 0.25 = \mathbf{25\%}$$

Convert 0.03 to a percent.

$$0.03 \rightarrow \underset{\cup}{0} \underset{\cup}{3} \rightarrow 3\% \qquad 0.03 = \mathbf{3\%}$$

Convert 0.629 to a percent.

$$0.629 \rightarrow \underset{\cup}{6} \underset{\cup}{2} \underset{\cup}{9} \rightarrow 62.9\% \qquad 0.629 = \mathbf{62.9\%}$$

Convert 0.3 to a percent.

$$0.3 \rightarrow \underset{\cup}{3} \underset{\cup}{.} \rightarrow 30\% \qquad 0.3 = \mathbf{30\%}$$

In this last example, fill in the empty ones column with a zero.

You can also use the calculator to convert a decimal to a percent.

The rule is: Multiply the decimal x 100, then add a percent sign.

To convert 0.29 to a percent, enter $.29 \times 100 =$ The calculator displays 29
Add percent sign $\rightarrow 29\%$

To convert 0.078 to a percent, enter $.078 \times 100 =$ The calculator displays 7.8
Add percent sign $\rightarrow 7.8\%$

Practice One Convert the following decimals to percents. Answers – p. 6

1. 0.27

2. 0.35

3. 0.82

4. 0.07

5. 0.7

6. 0.348

2. REVIEW – CONCEPT OF A FRACTION

A fraction represents the part you have of a whole thing. For example, $\frac{2}{3}$ of a pizza means if you divided the whole pizza into 3 equal parts, you would have 2 of the parts. The top of the fraction is the part you have and the bottom is the whole thing.

You have 2 out of 3 parts $\rightarrow \frac{2}{3}$ $\frac{\text{the part you have}}{\text{the whole thing}}$

6 out of 10 students $\rightarrow \frac{6}{10} = \frac{\text{part}}{\text{whole}}$

The whole thing, 10, is on the bottom, and the part you have, 6, is on the top.

\$3 out of \$22 $\rightarrow \frac{3}{22} = \frac{\text{part}}{\text{whole}}$

3. MECHANICS – CALCULATING THE PERCENT ONE NUMBER IS OF ANOTHER NUMBER

Some percent problems will require you to find what percent one number is of another number. For example, if a restaurant meal cost \$25 and a \$5 tip was left, what percent tip was left? You need to find what percent \$5 is of \$25.

To do this, think: I have \$5 out of \$25, and follow these 3 steps.

1. Make a fraction with the part you have, \$5, on the top,

and the whole, \$25, on the bottom: $\frac{5}{25}$

2. Divide to get a decimal: $5 \div 25 = 0.2$

3. Convert 0.2 to a percent: $0.2 = 20\%$

The tip left was 20%.

NOTE – Remember, think of the fraction bar as a division sign.

$\frac{5}{25}$ is the same as $5 \div 25$.

Examples

1. What percent of 800 is 200?

Think, I have 200 out of 800.

Make a fraction with the part on the top and the whole on the bottom: $\frac{200}{800}$

Divide to get a decimal: $200 \div 800 = 0.25$

Move the decimal 2 places to the right and add the % sign: **25%**

So, **200 is 25% of 800.**

2. What percent of 35 is 5? $\frac{5}{35} \rightarrow 5 \div 35 \rightarrow 0.1428 \rightarrow \mathbf{14.28\%}$
3. 6 is what percent of 75? $\frac{6}{75} \rightarrow 6 \div 75 \rightarrow 0.08 \rightarrow \mathbf{8\%}$
4. 9 is what percent of 250? $\frac{9}{250} \rightarrow 9 \div 250 \rightarrow 0.036 \rightarrow \mathbf{3.6\%}$

Practice Two Answers – p. 6

1. What percent of 65 is 5?
2. 16 is what percent of 90?
3. 4 is what percent of 50?
4. What percent is 240 of 800?

4. WORD PROBLEMS – CALCULATING THE PERCENT ONE NUMBER IS OF ANOTHER NUMBER

Example 1

22 students showed up for the Tuesday night yoga class. If there are 28 students enrolled, what percentage of students attended class.

- A. 6% B. 22% C. 28% D. 79% E. 27%

You are looking for what percent 22 is of 28.

22 is the top of the fraction (the part) and 28 is the bottom of the fraction (the whole).

$$\frac{22}{28} \rightarrow 22 \div 28 \rightarrow 0.7857 \rightarrow 78.57\% \text{ round to } 79\% \quad \mathbf{\text{Answer: D. 79\%}}$$

Example 2

A company awards a rebate to its customers as a percentage of their total purchases each month. If a customer purchased \$4,150 and received a rebate of \$62.25, what percentage is the rebate?

- A. 1.5% B. 15% C. 66.7% D. 2.5% E. .15%

You are looking for what percent \$62.25 is of \$4,150.

\$62.25 is on the top of the fraction (the part) and \$4,150 is on the bottom (the whole).

$$\frac{62.25}{4,150} \rightarrow 62.25 \div 4,150 \rightarrow 0.015 \rightarrow 1.5% \quad \text{Answer: A. 1.5%}$$

Example 3

I have saved \$250 for a new cell phone that costs \$350. What percent of the price do I still have left to save?

- A. 71% B. 29% C. 100% D. 92% E. 75%

The amount left to save: $\$350 - \$250 = \$100$

You are looking for what percent \$100 is of \$350.

\$100 is on the top of the fraction (the part) and \$350 is on the bottom (the whole).

$$\frac{100}{350} \rightarrow 100 \div 350 \rightarrow 0.2857 \rightarrow 28.57% \quad \text{round to 29%} \quad \text{Answer: B. 29%}$$

CAREFUL - You are given the amount already saved (\$250), but the question asks for the % that still has to be saved, so subtract before calculating the percent.

OR – Calculate the percent already saved and subtract from 100% to get the percent that still has to be saved.

$$\frac{250}{350} \rightarrow 250 \div 350 \rightarrow 0.7143 \rightarrow 71.43% \rightarrow 71% = \text{amount already saved}$$

$$100\% - 71\% = \mathbf{29\%} = \text{amount still to be saved}$$

Practice Three *Answers – p. 6*

1. Luis earns \$2,900 per month and spends \$375 each month on his car payment. What percentage of his earnings does he spend on his car payment?

- A. 1.3% B. 7.7% C. 13% D. 12% E. 10%

2. On a test with 40 questions, a student got 3 questions wrong. What percent of the questions did the student get right?

- A. 7.5% B. 92.5 % C. 37% D. 3% E. 29.5%

3. If a customer was charged \$2.70 sales tax on a \$45 purchase, what is the sales tax percentage?

- A. 16.6% B. 60% C. 2.7% D. 1.6% E. 6%

4. Lisa bought a bag of assorted candies, and just for fun wanted to know what percentage of them were cherry flavor. She counted 75 total candies and 18 cherry flavor candies. What percentage of the candies were cherry flavor?

- A. 24% B. 4% C. 2.4% D. 57% E. 18%

5. For groups of 8 or larger, a restaurant adds a tip as a percentage of the bill. If the bill for a group of 10 people was \$250 and the tip added was \$45, what percentage tip does the restaurant add?

- A. 6% B. 25% C. 15% D. 18% E. 20%

Refer to the chart below for questions 6 – 7.

ITEM	SALES
Coffee	\$255
Tea	\$75
Soda	\$475
Juice	\$75
Water	\$300
Milk	\$95

6. A business is analyzing its beverage sales for the week. What percentage of beverage sales were soda?

- A. 3.7% B. 73% C. 59% D. 37% E. 6%

7. What percentage of beverage sales were coffee and tea?

- A. 26% B. 2.6% C. 6% D. 4% E. 62%

8. If a mother allows her children to watch TV 2 hours per day, what percentage of each day are the children allowed to watch TV?

- A. 2% B. 8.33% C. 9.33% D. 12% E. 83.3%

9. If Anita is responsible for cooking dinner for the family 2 times each week, what percentage of the days does she have to cook dinner?

- A. 2.9% B. 2% C. 29% D. 9% E. 4%

ANSWER KEY Lesson 3 The Percent One Number is of Another Number

Practice One

1. $0.27 = 27\%$
2. $0.35 = 35\%$
3. $0.82 = 82\%$
4. $0.07 = 7\%$
5. $0.7 = 70\%$
6. $0.348 = 34.8\%$

Practice Two

1. What percent of 65 is 5? $\frac{5}{65} \rightarrow 5 \div 65 \rightarrow 0.0769 \rightarrow 7.69\%$

Think: 5 out of 65. Make a fraction with the part, 5, on top and the whole, 65, on the bottom.

2. 16 is what percent of 90? $\frac{16}{90} \rightarrow 16 \div 90 \rightarrow 0.178 \rightarrow 17.8\%$

Think: 16 out of 90. Make a fraction with the part, 16, on top and the whole, 90, on the bottom.

3. 4 is what percent of 50? $\frac{4}{50} \rightarrow 4 \div 50 \rightarrow 0.08 \rightarrow 8\%$

Think: 4 out of 50. Make a fraction with the part, 4, on top and the whole, 50, on the bottom.

4. What percent is 240 of 800? $\frac{240}{800} \rightarrow 240 \div 800 \rightarrow 0.3 \rightarrow 30\%$

Think: 240 out of 800. Make a fraction with the part, 240, on top and the whole, 800, on the bottom.

Practice Three

1. Luis earns \$2,900 per month and spends \$375 each month on his car payment. What percentage of his earnings does he spend on his car payment?

A. 1.3% B. 7.7% C. **13%** D. 12% E. 10%

You are looking for what percent \$375 is of \$2,900.

$$\frac{375}{2,900} \rightarrow 375 \div 2,900 \rightarrow 0.1293 \rightarrow 12.93\% \text{ round to } 13\%$$

Answer: C. 13%

2. On a test with 40 questions, a student got 3 questions wrong. What percent of the questions did the student get right?

- A. 7.5% **B. 92.5 %** C. 37% D. 3% E. 29.5%

You are given 3 questions wrong, and asked for the percent of questions right, so subtract to get the number of questions right, then calculate percent.

$$40 - 3 = 37 \text{ questions right.}$$

You are looking for what percent 37 is of 40.

$$\frac{37}{40} \rightarrow 37 \div 40 \rightarrow 0.925 \rightarrow 92.5\% \quad \text{Answer: B. 92.5\%}$$

OR – Calculate the percent of questions wrong and subtract from 100% to get the percent of questions right.

$$\frac{3}{40} \rightarrow 3 \div 40 \rightarrow 0.075 \rightarrow 7.5\% = \text{percent of questions wrong}$$

$$100\% - 7.5\% = \mathbf{92.5\%} = \text{percent of questions right}$$

3. If a customer was charged \$2.70 sales tax on a \$45 purchase, what is the sales tax percentage?

- A. 16.6% B. 60% C. 2.7% D. 1.6% **E. 6%**

You are looking for what percent \$2.70 is of \$45.

$$\frac{2.70}{45} \rightarrow 2.7 \div 45 \rightarrow 0.06 \rightarrow 6\%$$

Answer: E. 6%

4. Lisa bought a bag of assorted candies, and just for fun wanted to know what percentage of them were cherry flavor. She counted 75 total candies and 18 cherry flavor candies. What percentage of the candies were cherry flavor?

- A. 24%** B. 4% C. 2.4% D. 57% E. 18%

You are looking for what percent 18 is of 75.

$$\frac{18}{75} \rightarrow 18 \div 75 \rightarrow 0.24 \rightarrow 24\%$$

Answer: A. 24%

5. For groups of 8 or larger, a restaurant adds a tip as a percentage of the bill. If the bill for a group of 10 people was \$250 and the tip added was \$45, what percentage tip does the restaurant add?

- A. 6% B. 25% C. 15% **D. 18%** E. 20%

You are looking for what percent \$45 is of \$250.

$$\frac{45}{250} \rightarrow 45 \div 250 \rightarrow 0.18 \rightarrow 18\% \quad \text{Answer: D. 18\%}$$

Refer to the chart below for questions 6 – 7.

ITEM	SALES
Coffee	\$255
Tea	\$75
Soda	\$475
Juice	\$75
Water	\$300
Milk	\$95

6. A business is analyzing its beverage sales for the week. What percentage of beverage sales were soda?

- A. 3.7% B. 73% C. 59% **D. 37%** E. 6%

You are looking for what percent \$475 is of the total. Add up all the sales in the chart to get total sales of \$1,275.

$$\frac{475}{1,275} \rightarrow 475 \div 1,275 \rightarrow 0.3725 \rightarrow 37.25\% \text{ rounds to } 37\% \quad \textbf{Answer: D. 37\%}$$

7. What percentage of beverage sales were coffee and tea?

- A. 26%** B. 2.6% C. 6% D. 4% E. 62%

Add coffee and tea sales together to get \$330.

Then find what percent \$330 is of \$1,275.

$$\frac{330}{1,275} \rightarrow 330 \div 1,275 \rightarrow 0.2588 \rightarrow 25.88\% \text{ rounds to } 26\% \quad \textbf{Answer A. 26\%}$$

8. If a mother allows her children to watch TV 2 hours per day, what percentage of each day are the children allowed to watch TV?

- A. 2% **B. 8.33%** C. 9.33% D. 12% E. 83.3%

You are looking for what percent 2 hours is out of a day. You have to supply the total of 24 hours in a day, so you want to find: 2 is what percent of 24.

$$\frac{2}{24} \rightarrow 2 \div 24 \rightarrow 0.0833 \rightarrow 8.33\%$$

Answer: B. 8.33%

9. If Anita is responsible for cooking dinner for the family 2 times each week, what percentage of the days does she have to cook dinner?

- A. 2.9% B. 2% **C. 29%** D. 9% E. 4%

You are looking for what percent 2 days is out of a week. You have to supply the total of 7 days in a week, so you want to find: 2 is what percent of 7.

$$\frac{2}{7} \rightarrow 2 \div 7 \rightarrow 0.2857 \rightarrow 28.57\% \text{ rounds to } 29\%$$

Answer: C. 29%