

**TOPIC 1: Fractions, Decimals, and Percents**

Every fraction can be expressed as a decimal or as a percent.

*Example 1:* Write  $\frac{3}{20}$  as a decimal and as a percent.

We use division to write the fraction as a decimal:

$$\frac{3}{20} = 3 \div 20 = 0.15$$

To write a decimal as a percent, we multiply the decimal by 100 and attach the percent symbol:

$$\frac{3}{20} = 0.15 = (0.15 \cdot 100)\% = 15\%$$

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1. Copy and complete the following table in your notebook. You will be given a card with a fraction, decimal, or percent for the final row.

Reduced Fraction	Decimal	Percent
$\frac{1}{2}$		
		80%
	0.35	
		75%
$\frac{2}{25}$		
	0.10	
$\frac{1}{5}$		
	0.6	
		30%
	$0.\overline{3}$	
$\frac{1}{7}$		
		12.5%

The word problems below involve fractions or percents. Remember that we can translate the word “of” into multiplication. For example, “one-third of two-fifths” means  $\frac{1}{3} \cdot \frac{2}{5}$ . Also, don’t forget to change percents into decimal form when using them in an expression or equation. For instance, “two percent of one thousand” means  $0.02 \cdot 1000$ .

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For exercises 2-8, solve the word problem and write your answer in a complete sentence.

2. Three people are working on a group project: Nadia, Jim, and Luisa. If Nadia did one-fifth of the project and Jim did three-fifths of the project, how much of the project does Luisa need to complete?
3. In order to make bread, Troy needs one pound of flour. In one bag in his cabinet, he has one-third of a pound, and in another bag he has one-quarter of a pound. How much more flour does he need?
4. Alisa wanted to buy a new jacket, but didn't want to spend more than \$50, including tax. She found a jacket that was originally \$60, but was on sale for 20% off. If sales tax is 8%, is this jacket within her budget? What if it was on sale for 25% off?
5. Wanda wanted to buy a certain laptop computer that was normally priced at \$1400, so she looked at ads in the Sunday paper to see where she could get a good deal. She narrowed her choices down to two stores. At one store, the computer was on sale for 20% off and had a \$150 mail-in rebate. At the other store, the computer was on sale for 30% off. Explain which one is the better deal?
6. Jeremy was at a bookstore buying a book when he was offered a discount card. The card cost \$15 and every time he used it he would save 10% on his purchases at the bookstore for a year. How much money would he have to spend at that bookstore in a year in order to make the card worth buying?
7. Elisa gets paid \$1200 a month. One-half of her paycheck goes for rent and one-third goes for living expenses. How much money does she have left for entertainment and miscellaneous expenses? What percentage of her paycheck is this amount?
8. A company bought a new computer for \$1728. This price included 8% sales tax. What was the computer’s price before sales tax?

- 9a. Draw a rectangular candy bar.
- Shade about three-quarters of the candy bar in your drawing.
  - When you take half of something do you get more or less than what you started with?
  - Divide the shaded portion of your candy bar in half. Now you have one-half of three-fourths of your candy bar. Do you have more or less than half of the candy bar pictured? Do you have more or less than three-fourths of the candy bar pictured?
- 10a. Draw a number line showing the values 0 and 1.
- Choose a fraction between 0 and 1, plot it on your number line, and write your fraction below the point you plotted. Label this point  $A$ .
  - Choose another fraction between point  $A$  and 1. Plot this fraction on your number line, write the fraction below the point you plotted, and label it point  $B$ .
  - Do you think  $A \cdot B$  is between 0 and  $A$ ,  $A$  and  $B$ , or  $B$  and 1?
  - Now find the actual value of  $A \cdot B$  and plot that point on the number line.
  - Is  $A \cdot B$  in the interval you thought it would be in? Check with other people in the class and see what results they had, and what fractions they began with. What can you conclude from this information?
11. Now draw a number line showing the values 0, 1, and 2. Choose a fraction between 0 and 1. Plot this fraction on a number line, write the fraction under your point, and label it point  $A$ . Now choose a fraction between 1 and 2. Plot this point, write the fraction under your point, and label it point  $B$ . Do you think  $A \cdot B$  is between 0 and  $A$ ,  $A$  and 1, 1 and  $B$ , or  $B$  and 2? Compare with the people around you. Did you choose similar values for  $A$  and  $B$ ? Did you guess the same intervals? Now find the actual value of  $A \cdot B$ , and plot that point on your number line. Was your guess close? What can you conclude from your results and the results of the people around you?