

Lesson 5: Finding One Hundred Percent Given Another Percent

Classwork

Opening Exercise

What are the whole number factors of 100? What are the multiples of those factors? How many multiples are there of each factor (up to 100)?

Factors of 100	Multiples of the Factors of 100	Number of Multiples
100	100	1
50	50, 100	2
1	1, 2, 3, 4, 5, 6, ... , 98, 99, 100	100

Example 1: Using a Modified Double Number Line with Percents

The 42 students who play wind instruments represent 75% of the students who are in band. How many students are in band?

Example 2: Mental Math Using Factors of 100

Answer each part below using only mental math, and describe your method.

- a. If 39 is 1% of a number, what is that number? How did you find your answer?
- b. If 39 is 10% of a number, what is that number? How did you find your answer?
- c. If 39 is 5% of a number, what is that number? How did you find your answer?
- d. If 39 is 15% of a number, what is that number? How did you find your answer?
- e. If 39 is 25% of a number, what is that number? How did you find your answer?

Lesson Summary

To find 100% of the whole, you can use a variety of methods, including factors of 100 (1, 2, 4, 5, 10, 20, 25, 50, and 100) and double number lines. Both methods will require breaking 100% into equal-sized intervals. Use the greatest common factor of 100 and the percent corresponding to the part.

Problem Set

Use a double number line to answer Problems 1–5.

1. Tanner collected 360 cans and bottles while fundraising for his baseball team. This was 40% of what Reggie collected. How many cans and bottles did Reggie collect?
2. Emilio paid \$287.50 in taxes to the school district that he lives in this year. This year's taxes were a 15% increase from last year. What did Emilio pay in school taxes last year?
3. A snowmobile manufacturer claims that its newest model is 15% lighter than last year's model. If this year's model weighs 799 lb., how much did last year's model weigh?
4. Student enrollment at a local school is concerning the community because the number of students has dropped to 504, which is a 20% decrease from the previous year. What was the student enrollment the previous year?
5. The color of paint used to paint a race car includes a mixture of yellow and green paint. Scotty wants to lighten the color by increasing the amount of yellow paint 30%. If a new mixture contains 3.9 liters of yellow paint, how many liters of yellow paint did he use in the previous mixture?

Use factors of 100 and mental math to answer Problems 6–10. Describe the method you used.

6. Alexis and Tasha challenged each other to a typing test. Alexis typed 54 words in one minute, which was 120% of what Tasha typed. How many words did Tasha type in one minute?
7. Yoshi is 5% taller today than she was one year ago. Her current height is 168 cm. How tall was she one year ago?
8. Toya can run one lap of the track in 1 min. 3 sec., which is 90% of her younger sister Niki's time. What is Niki's time for one lap of the track?
9. An animal shelter houses only cats and dogs, and there are 25% more cats than dogs. If there are 40 cats, how many dogs are there, and how many animals are there total?

10. Angie scored 91 points on a test but only received a 65% grade on the test. How many points were possible on the test?

For Problems 11–17, find the answer using any appropriate method.

11. Robbie owns 15% more movies than Rebecca, and Rebecca owns 10% more movies than Joshua. If Rebecca owns 220 movies, how many movies do Robbie and Joshua each have?
12. 20% of the seventh-grade students have math class in the morning. $16\frac{2}{3}\%$ of those students also have science class in the morning. If 30 seventh-grade students have math class in the morning but not science class, find how many seventh-grade students there are.
13. The school bookstore ordered three-ring notebooks. They put 75% of the order in the warehouse and sold 80% of the rest in the first week of school. There are 25 notebooks left in the store to sell. How many three-ring notebooks did they originally order?
14. In the first game of the year, the modified basketball team made 62.5% of their foul shot free throws. Matthew made all 6 of his free throws, which made up 25% of the team's free throws. How many free throws did the team miss altogether?
15. Aiden's mom calculated that in the previous month, their family had used 40% of their monthly income for gasoline, and 63% of that gasoline was consumed by the family's SUV. If the family's SUV used \$261.45 worth of gasoline last month, how much money was left after gasoline expenses?
16. Rectangle A is a scale drawing of Rectangle B and has 25% of its area. If Rectangle A has side lengths of 4 cm and 5 cm, what are the side lengths of Rectangle B?



17. Ted is a supervisor and spends 20% of his typical work day in meetings and 20% of that meeting time in his daily team meeting. If he starts each day at 7:30 a.m., and his daily team meeting is from 8:00 a.m. to 8:20 a.m., when does Ted's typical work day end?