

Lesson 17: Divisibility Tests for 3 and 9

Classwork

Opening Exercise

Below is a list of 10 numbers. Place each number in the circle(s) that is a factor of the number. You will place some numbers in more than one circle. For example, if 32 were on the list, you would place it in the circles with 2, 4, and 8 because they are all factors of 32.

24; 36; 80; 115; 214; 360; 975; 4,678; 29,785; 414,940

The diagram shows five large circles arranged in two rows. The top row contains three circles with labels 2, 4, and 5. The bottom row contains two circles with labels 8 and 10. Each label is inside a small rectangular box at the top of its respective circle.

Discussion

- Divisibility rule for 2:
- Divisibility rule for 4:
- Divisibility rule for 5:
- Divisibility rule for 8:
- Divisibility rule for 10:
- Decimal numbers with fraction parts do not follow the divisibility tests.
- Divisibility rule for 3:
- Divisibility rule for 9:

Example 1

This example will show you how to apply the two new divisibility rules we just discussed.

Is 378 divisible by 3 or 9? Why or why not?

- a. What are the three digits in the number 378?
- b. What is the sum of the three digits?
- c. Is 18 divisible by 9?
- d. Is the entire number 378 divisible by 9? Why or why not?

- e. Is the number 378 divisible by 3? Why or why not?

Example 2

Is 3,822 divisible by 3 or 9? Why or why not?

Exercises 1–5

Circle ALL the numbers that are factors of the given number. Complete any necessary work in the space provided.

1. Is 2,838 divisible by

3

9

4

Explain your reasoning for your choices.

2. Is 34,515 divisible by

3

9

5

Explain your reasoning for your choices.

3. Is 10,534,341 divisible by

3

9

2

Explain your reasoning for your choices.

4. Is 4,320 divisible by

3

9

10

Explain your reasoning for your choices.

5. Is 6,240 divisible by

3

9

8

Explain your reasoning for your choices.

Lesson Summary

To determine if a number is divisible by 3 or 9:

- Calculate the sum of the digits.
- If the sum of the digits is divisible by 3, the entire number is divisible by 3.
- If the sum of the digits is divisible by 9, the entire number is divisible by 9.

Note: If a number is divisible by 9, the number is also divisible by 3.

Problem Set

1. Is 32,643 divisible by both 3 and 9? Why or why not?
2. Circle all the factors of 424,380 from the list below.
2 3 4 5 8 9 10
3. Circle all the factors of 322,875 from the list below.
2 3 4 5 8 9 10
4. Write a 3 digit number that is divisible by both 3 and 4. Explain how you know this number is divisible by 3 and 4.
5. Write a 4 digit number that is divisible by both 5 and 9. Explain how you know this number is divisible by 5 and 9.