

LESSON 1

Factors and Divisibility

Objectives:

To tell if a number is divisible by 2, 3, 4, 5, 6, 9, and 10.

To tell what are the factors of a certain number.

→ **Divisibility rules are rules that help you to tell if a certain whole number is divisible by other numbers without using division.**

In general, a number is divisible by another number when the quotient is a whole number and the remainder is zero.

Divisibility Rules	
A number is divisible by:	
2	If the ones digit is an even number
3	If the sum of the digits is divisible by 3
4	If the last 2 digits form a number divisible by 4
5	If the ones digit is 0 or 5
6	If the number is divisible by both 2 and 3
9	If the sum of the digits is divisible by 9
10	If the ones digit is 0

EXAMPLE 1: USING DIVISIBILITY RULES**A) Tell if 24 is divisible by 2, 3, 4, 5, 6, 9, or 10.**

24 is divisible by 2 because 4 is an even number.

24 is divisible by 3 because the sum of 2 and 4 is 6, and 6 is divisible by 3.

24 is divisible by 4 because 24 is a multiple of 4.

24 is not divisible by 5 because the last digit is not 0 or 5.

24 is divisible by 6 because it is divisible by both 2 and 3.

24 is not divisible by 9 because the sum of 2 and 4 is 6, and 6 is not divisible by 9.

24 is not divisible by 10 because the ones digit is not 0.

So, 24 is divisible by 2, 3, 4, and 6.

B) From 81 to 85, tell which numbers are divisible by 3.

81 is divisible by 3 because the sum of 8 and 1 is 9.

82 is not divisible by 3 because the sum of 8 and 2 is 10.

83 is not divisible by 3 because the sum of 8 and 3 is 11.

84 is divisible by 3 because the sum of 8 and 4 is 12.

85 is not divisible by 3 because the sum of 8 and 5 is 13.

So, 81 and 84 are divisible by 3.

CHECK IT 1

A) Tell if 54 is divisible by 2, 3, 4, 5, 6, 9, or 10.

2, 3, 6, and 9

B) From 56 to 60, tell which numbers are divisible by 2.

56, 58, and 60

C) The table below shows the total number of students in grades 6, 7, and 8. The students of which grade level can be divided in groups of 4? Explain.

Class	Number of Students
6	112
7	107
8	114

112 is divisible by 4. Grade 6 students can be divided into groups of 4

➔ Factors are numbers that you can multiply together to get another number.

For example, the factors of 6 are 1, 2, 3, and 6.

$$\underline{1} \times \underline{6} = 6$$

$$\underline{2} \times \underline{3} = 6$$

EXAMPLE 2: FINDING FACTORS

A) Find all the factors of 20.

$$\underline{1} \times \underline{20} = 20$$

$$\underline{2} \times \underline{10} = 20$$

$$\underline{4} \times \underline{5} = 20$$

The factors of 20 are 1, 2, 4, 5, 10, and 20

B) Find all the factors of 36.

$$\underline{1} \times \underline{36} = 36$$

$$\underline{2} \times \underline{18} = 36$$

$$\underline{3} \times \underline{12} = 36$$

$$\underline{4} \times \underline{9} = 36$$

$$\underline{6} \times \underline{6} = 36$$

The factors of 36 are 1, 2, 3, 4, 6, 9, 12, 18, and 36.

CHECK IT 2

A) Find all the factors of 24.

1, 2, 3, 4, 6, 8, 12, and 24

B) Find all the factors of 50.

1, 2, 5, 10, 25, and 50

C) What are the first four factors of 80?

1, 2, 4, and 5

D) Word Problem: Running one lap takes Andy 6 minutes.

How many laps can Andy run in 24 minutes?

Andy can run 4 laps in 24 minutes



Practice

Tell whether each number is divisible by 2, 3, 4, 5, 6, 9, or 10.

1. 45

3, 5, and 9

2. 210

2, 3, 5, 6, and 10

3. 228

2, 3, 4, and 6

4. 3,080

2, 4, 5, and 10

5. 4,002

2, 3, and 6

6. 12,762

2, 3, 6, and 9

List all the factors of the following numbers.

10. 14

1, 2, 7, and 14

11. 28

1, 2, 4, 7, 14, and 28

12. 31

1 and 31

13. 32

1, 2, 4, 8, 16, and 32

14. 60

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, and 60

15. 72

1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 36, and 72

List the first four factors of each number.

16. 240

1, 2, 3, and 4

17. 444

1, 2, 3, and 4

18. 3,020

1, 2, 4, and 5

Word Problem:

22. Jason is helping his father paint the exterior of their house. He knows that paint rollers come in packages of 3. If his father needs 20 rollers, how many packages will he need to buy?

Jason will need to buy 7 packages



Multiple Choice:

23. Philipp notes that 31 and 41 are not divisible by any number except themselves and 1. He concludes that if a number ends in 1, it cannot be divided by any number other than itself and 1. Which number shows that his conclusion is wrong?

- A 11
C 61

- B** 51
D 71

24. Judd said that 26 has 2 factors only. His friend Ronnie told him that 26 has 4 factors. A third friend, Jonas, claimed that 26 has 6 factors, while Kevin's answer was 8 factors. Which of the friends had the correct answer?

- A Judd
C Jonas

- B** Ronnie
D Kevin

Homework

Tell whether each number is divisible by 2, 3, 4, 5, 6, 9, or 10.

1. 15

3 and 5

2. 60

2, 3, 4, 5, 6, and 10

3. 102

2, 3, and 6

4. 399

3 only

5. 1,005

3 and 5

6. 22,662

2, 3, 6, and 9

List all the factors of the following numbers

7. 10

1, 2, 5, and 10

8. 32

1, 2, 4, 8, 16, and 32

9. 71

1 and 71

10. 80

1, 2, 4, 8, 10, 20, 40, and 80

11. 81

1, 3, 9, 27, and 81

12. 100

1, 2, 4, 5, 10, 20, 25, 50, and 100

13. Word Problem: There are 725 muffins to be arranged on plates. Tell whether the muffins can be divided into groups of 2, 3, 4, 5, 6, 9, or 10.

The muffins can only be divided into groups of 5



Multiple Choice:

14. Sara concluded that 31, 41, 51, and 61 are divisible by 3. Sally said that Sara's conclusion is not correct. Which number between the four numbers is divisible by 3?

A 31

C 51

B 41

D 61

15. Ryan said that 20 has 2 factors only. His friend Jaime told him that 20 has 4 factors. A third friend, Javier, claimed that 20 has 6 factors, while Mario's answer was 8 factors. Which of the friends had the correct answer?

A Ryan

C Javier

B Jaime

D Mario