

Lesson 9 – Divisibility Rules

Starter

- 1) $5 - -6$
- 2) $3 + -8$
- 3) $(-4)^2$
- 4) 3×-7
- 5) $10 \div -2$
- 6) -56×-21

Starter Answers

- 1) 11 2) -5 3) 16 4) -21 5) -5 6) 1176

In this lesson, we will look at some **divisibility rules** that will help us to decide what numbers are divisible by.

Is a number divisible by 3?

There is a nice trick we can use to decide if a number is divisible by 3. If we add the digits, and the answer is a multiple of 3, then the original number must also be a multiple of 3 as well.

Example 1

Is 42894 divisible by 3?

$$4 + 2 + 8 + 9 + 4 = 27$$

27 is a multiple of 3, therefore 42894 is also a multiple of 3

Example 2

Is 830276 a multiple of 3?

$$8 + 3 + 0 + 2 + 7 + 6 = 26$$

26 is not a multiple of 3, therefore 830276 is also not a multiple of 3

There are tests we can use for other numbers too.

	Test
2	If the number is even, it is a multiple of 2
3	Digits sum to a multiple of 3
4	If the last two digits are a multiple of 4, then so is the number
5	Ends in a 5 or a 0
6	Must be divisible by 2 and 3
8	If the number can be divided by 2 three times, it is divisible by 8
9	Digits sum to a multiple of 9
10	Ends in a 0

Examples

1) Is 364 divisible by 4?

The last two digits are 64
64 is divisible by 4
Therefore, 364 is also divisible by 4

2) Is 369 divisible by 9?

The digits sum to $3 + 6 + 9 = 18$
18 is a multiple of 9
Therefore 369 is a multiple of 9

3) Is 144 divisible by 6?

144 is divisible by 2 since $144 \div 2 = 72$
144 is divisible by 3 since $144 \div 3 = 48$
Therefore it is a multiple of 6

Testing for Divisibility by 7

There is also a test to decide whether a number is divisible by 7.

Example

Is 273 divisible by 7?

27

First **truncate** the number by removing the units
Truncate just means to shorten

$$2 \times 3 = 6$$

$$27 - 6 = 21$$

Double the units you got rid of
Subtract this from the truncated number

If the answer is divisible by 7 then so is the original number

21 is divisible by 7 so 273 is divisible by 7