

- A number is divisible by 3 if the sum of the digits is divisible by 3.

Is the number 135 divisible by 3?

Add the digits:  $1 + 3 + 5 = 9$

*Yes, 135 is divisible by 3 because the sum of the digits is divisible by 3.*



A number is also divisible by 9 if the sum of its digits is divisible by 9

Do you know why?

135

Expanded form:



$$\begin{array}{ccccccc}
 100 & + & 30 & + & 5 & = & 135 \\
 \downarrow & & \downarrow & & \downarrow & & \\
 \cancel{99} + 1 & & \cancel{9} + 1 & & 5 & & \\
 & & \cancel{9} + 1 & & & & \\
 & & \cancel{9} + 1 & & & & \\
 & & & & & & 1 + 3 + 5 = 9
 \end{array}$$

I can re-group all the place values in groups of 9's plus 1, I can see that all groups of 99, and 9 are divisible by 3 and 9, so all I have to do is add the remaining 1's to see if the number is divisible by 3 or 9

Lets try again...

$$426 = 400 + 20 + 6$$

$\begin{array}{l} \cancel{9} \cancel{9} + 1 \\ \cancel{9} \cancel{9} + 1 \\ \cancel{9} \cancel{9} + 1 \\ \cancel{9} \cancel{9} + 1 \end{array}$ 
 $\begin{array}{l} \cancel{9} + 1 \\ \cancel{9} + 1 \end{array}$ 
 $\begin{array}{l} 6 \\ 12 \\ 3 \checkmark \\ 9 \times \end{array}$

$$127 =$$

$$324 =$$

$$2643 =$$

~~4,163,894,599,333~~

376,252

972, 365, 139

8,749,264,823,589,127,481,649,716,348,747,129

eight decillion, seven hundred forty-nine nonillion, two hundred sixty-four octillion, eight hundred twenty-three septillion, five hundred eighty-nine sextillion, one hundred twenty-seven quintillion, four hundred eighty-one quadrillion, six hundred forty-nine trillion, seven hundred sixteen billion, three hundred forty-eight million, seven hundred forty-seven thousand, one hundred twenty-nine

True or false?

1.) All numbers that are Divisible by 3 are also divisible by 9.

2.) All numbers that are divisible by 9 are also divisible by 3.

Explain using examples!

Math Focus p. 9-10

#1-10

So now that you know the Divisibility rules for **2** and **3**. Can you figure out the rule for **6** ?



$$2 \times 3 = 6$$

$$3 \times 2 = 6$$

$$6 \div 2 = 3$$

$$6 \div 3 = 2$$

3456

321

566

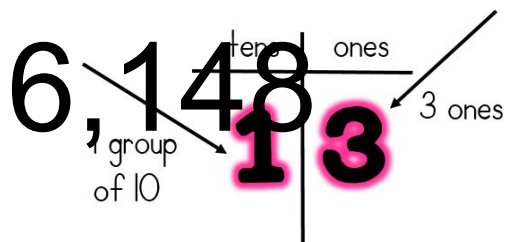
853

## Divisibility by 4

A number is divisible by 4 if the last 2 digits are divisible by 4 <https://www.online-calculator.com/full-screen-calculator/>



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5,628

231

Now its your turn...

127

348

2514

Because I know that all groups of 100 are divisible by 4  
( $4 \times 25 = 100$ ) , I only need to look at the **tens** and **ones** place  
value to determine if a number is divisible by 4.



## Divisibility by 8

A number is divisible by 8 if the last 3 digits are divisible by 4

 <https://www.online-calculator.com/full-screen-calculator/>



Yes!!! the Hundreds, Tens and the Ones

2356

332

6772

134

Interactions p34.

