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Factors and Multiples

Unit 4 Lesson 3

Math 4

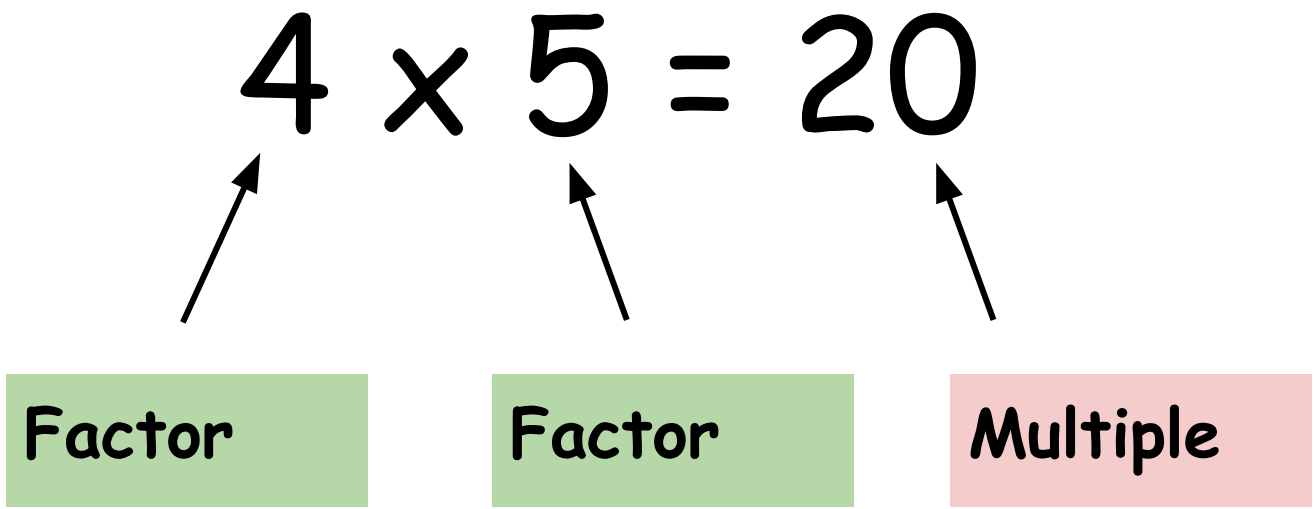
Students will be able to...

- Find all factor pairs for a whole number in the range 1-100.
- Recognize 2 that a whole number is a multiple of each of its factors.
- Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number.
- Determine whether a given whole number in the range 1-100 is prime or composite.

Key Vocabulary

Factor
Factor pairs
Prime
Composite
Divide
Multiple
Product

Let's look at factors and multiples in an equation.



What is a factor?

-The numbers that are multiplied to get a given number.

For example…

Find all the

Factors of 16.

16	
1	16
2	8
4	4

Ask yourself…
What factors can I multiply together to get the product??

1 x 16=16
2x8=16
4x4=16

Factors of 16 are 1, 2, 4, 8, 16

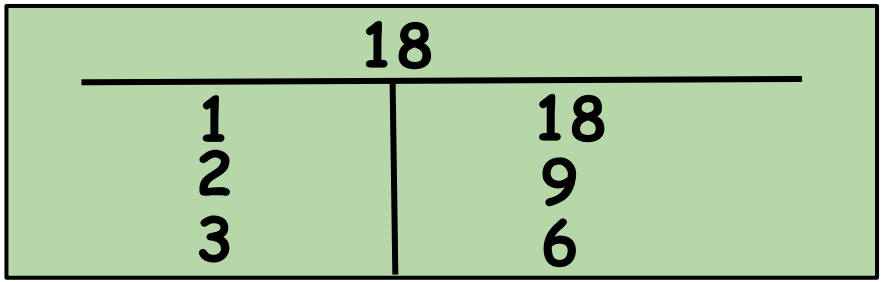
- The first factor of every number greater than 0 is 1.
- Factors never go beyond the number you are finding factors for.

Let's try…

Find all the factors of 18

Ask yourself…

What factors can I multiply together to get 18?



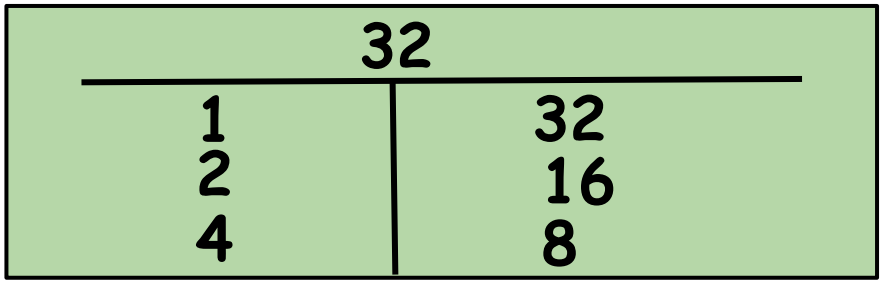
Factors of 18 are 1, 2, 3, 9, 18

Let's try…

Find all the factors of 32

Ask yourself…

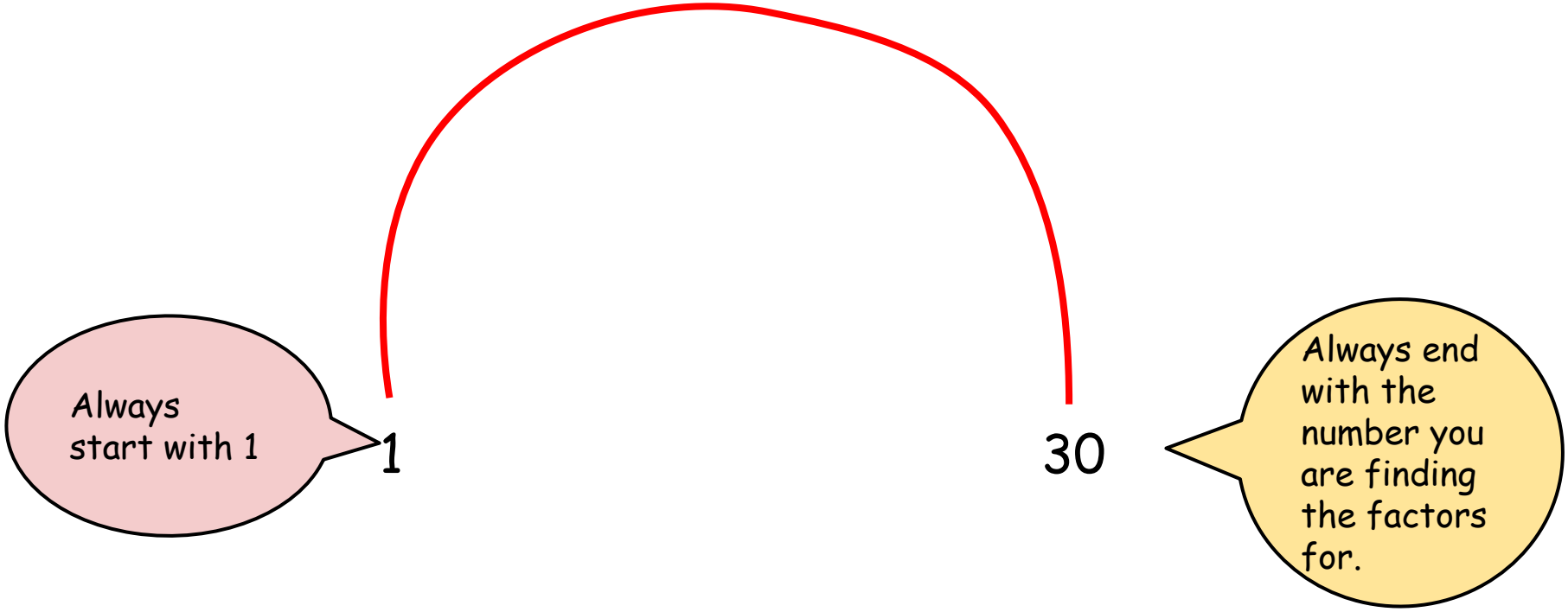
What factors can I multiply together to get 32?

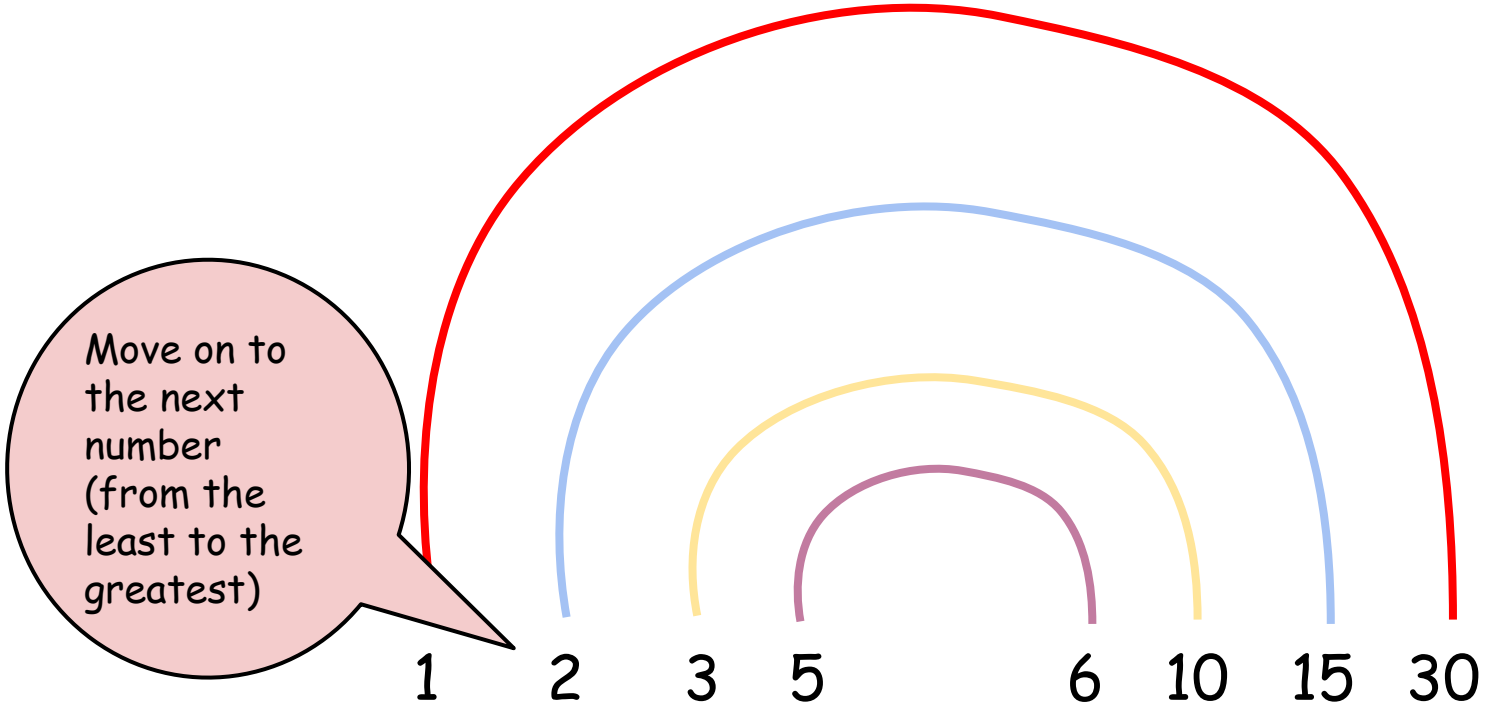


Factors of 32 are 1, 2, 4, 8, 16,32

You can draw a Factor Rainbow to find all the factors!

Find all the factors of 30



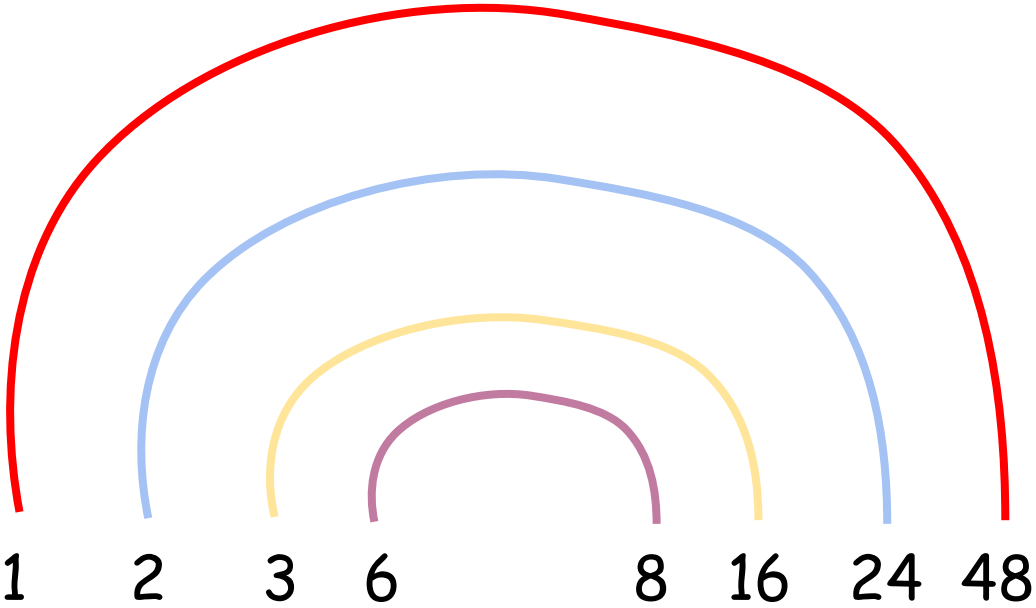


Factors of 30 are 1,2,3,5,6,10,15,30

Let's try...

Find all the factors of 48

Let's draw a factor rainbow.

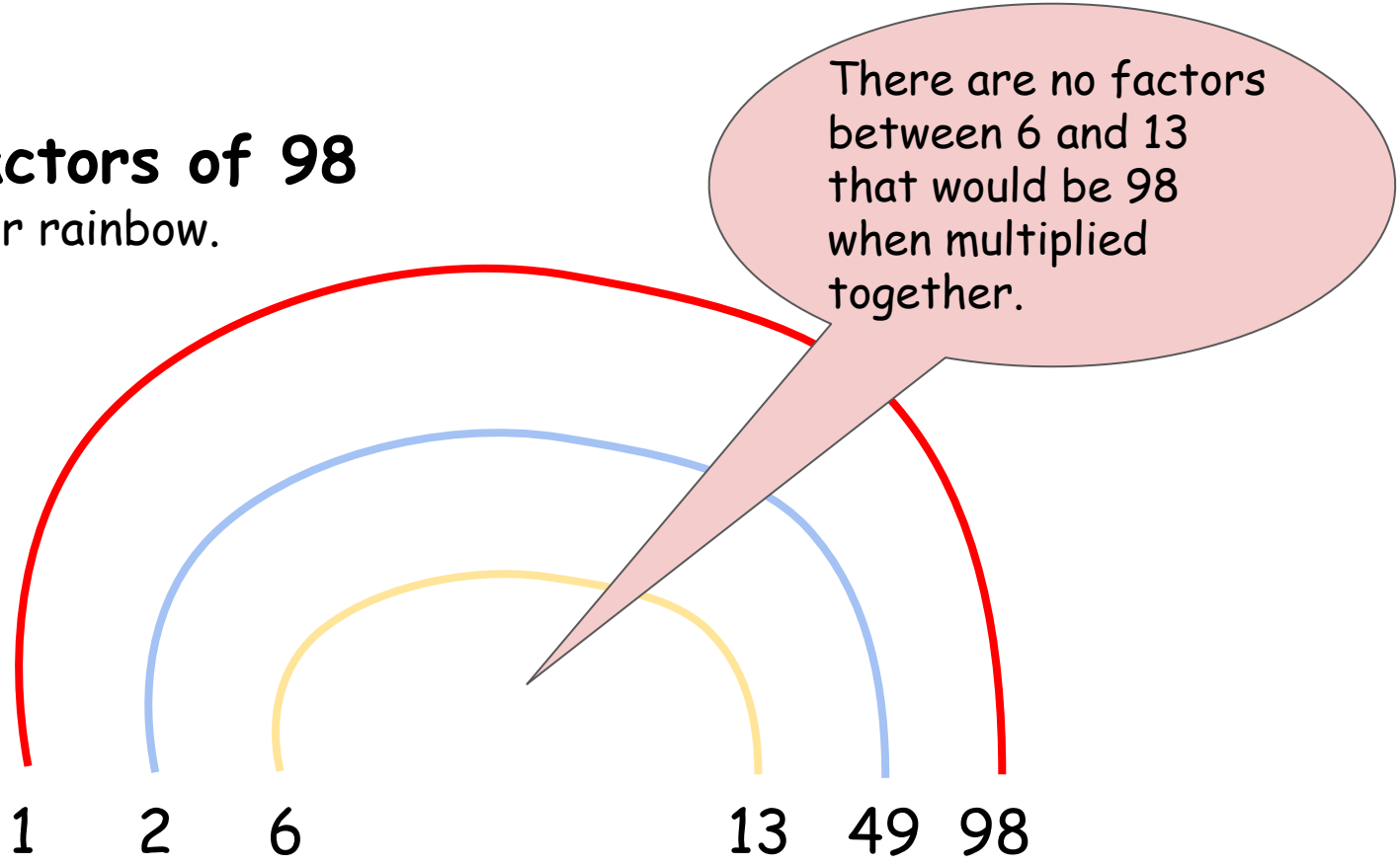


Factors of 48 are 1,2,3,6,8,16,24,48

Let's try…

Find all the factors of 98

Let's draw a factor rainbow.



Factors of 98 are 1,2,6,13,49,90

What is a multiple?

-The product of a given number and another factor multiplied together.

For example…

What is multiples of 4?

4x1=4

4x2=8

4x3=12

4x4=16

4x5=20

All of these are multiples of for and you can keep going on and on!

- There is no limit to the number of multiples a number can have.
- The first multiple of every number greater than zero is the number you are finding multiples for.

Let's try...

Find all the first 6 multiples of 6

Think this way...
Multiple = Product.
Keep multiplying until you get 6 products.

6 x 1 = **6**	6 x 2 = **12**	6 x 3 = **18**
6 x 4 = **24**	6 x 5 = **30**	6 x 6 = **36**

The first 6 multiples of 6 are 6, 12, 18, 24, 30, 36

Let's try...

What are the first 6 multiples of 10?

10 x 1 = **10**	10 x 2 = **20**	10 x 3 = **30**
10 x 4 = **40**	10 x 5 = **50**	10 x 6 = **60**

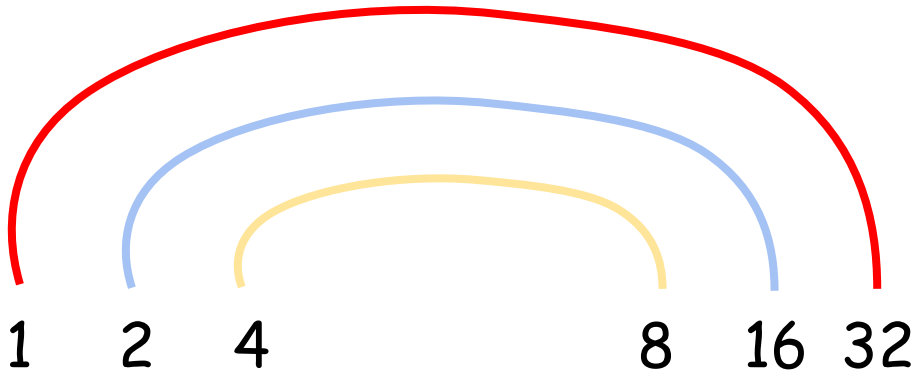
The first 6 multiples of 10 are 10, 20, 30, 40, 50, 60

What is a factor pair?

-Factor pair of a number is two numbers that you can multiply together to get the target number.

For example…

What are the factor pairs for 32?



$1 \times 32 = 32$

$2 \times 16 = 32$

$4 \times 8 = 32$

Would 2 & 32 be a factor pair?

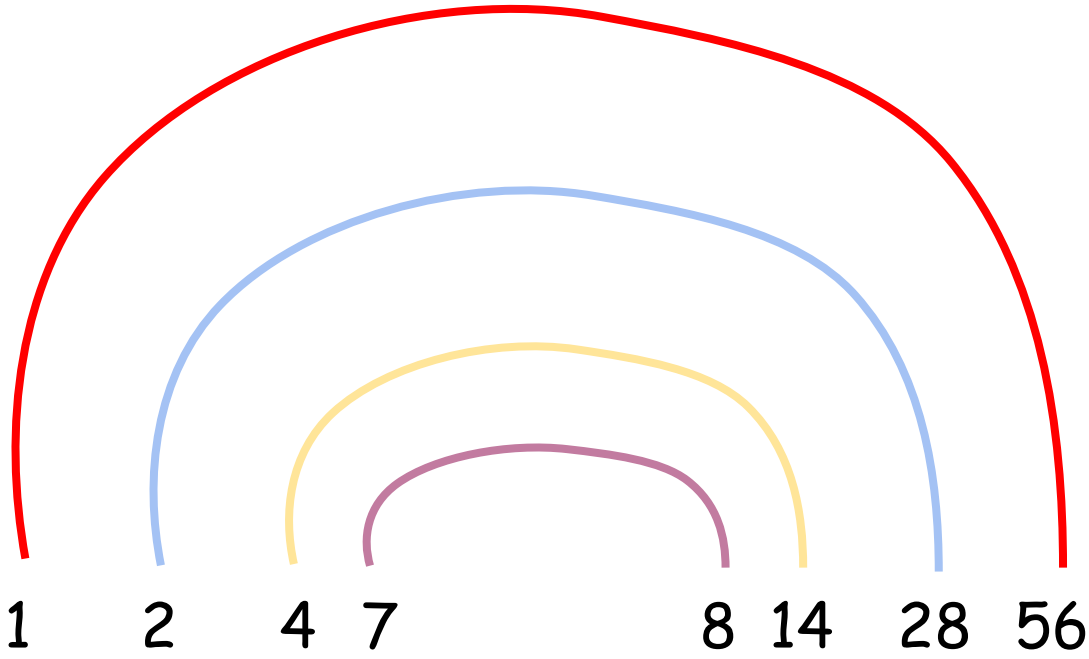
- No, because they don't make 32 when multiplied together.

Answer:

1&32, 2&16, 4&8 are the factor pairs for 32.

Let's try...

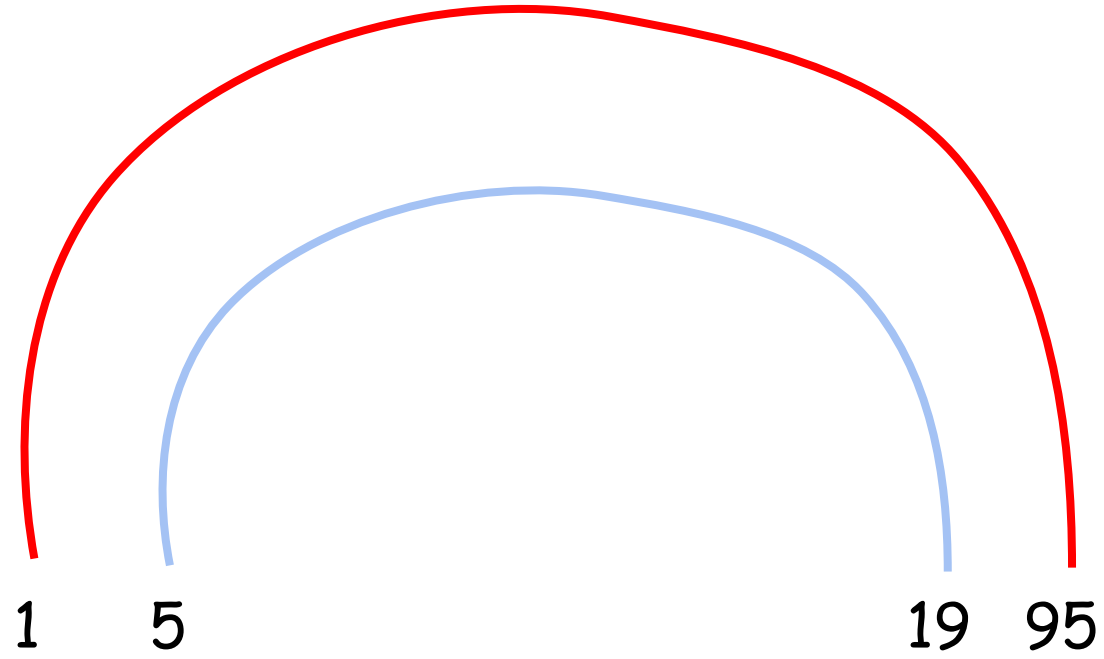
What are the factor pairs for 56?



1&56, 2&28, 4&14, 7&8 are the factor pairs for 56.

Let's try...

What are the factor pairs for 95?

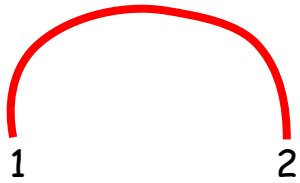


1&95, 5&19 are the factor pairs for 95.

What is a prime number?

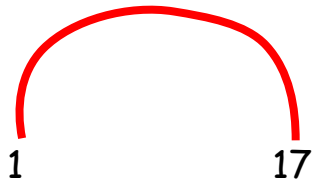
A prime number has only two factors: 1 and itself.

2 is a prime number

Why? 

It's because 2 has only two factors, 1 and 2.

17 is a prime number

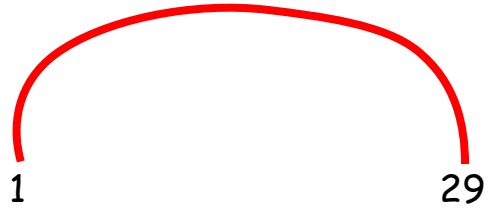
Why? 

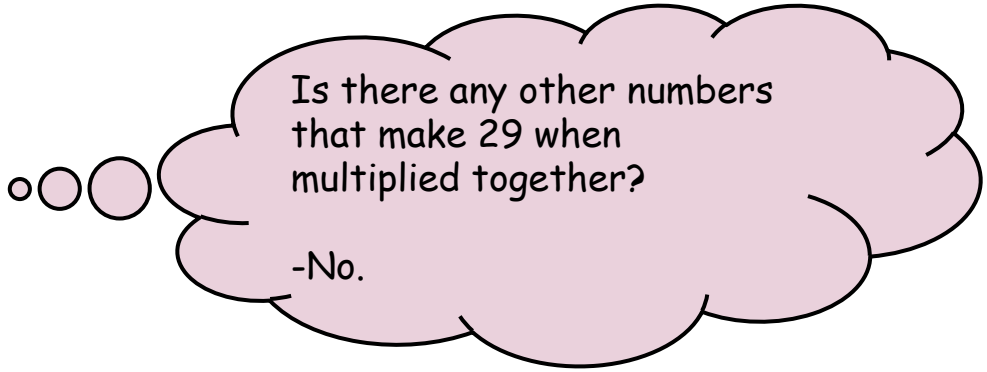
It's because 17 has only two factors, 1 and 17.

True or False?

"29 is a prime number."

Let's find the factors of 29 and find out if 29 is a prime number or not.



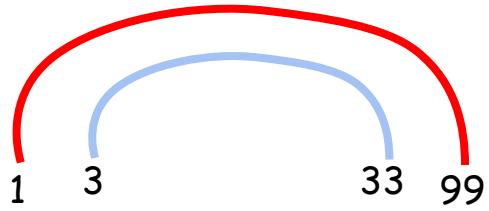


The statement is true because 29 only has two factors, 1 and 29.

True or False?

"99 is a prime number."

Let's find the factors of 99 and find out if 99 is a prime number or not.



1 x 99 = 99
3 x 33 = 99

The factors of 99 are 1, 3, 33, 99

The statement is false because 99 has more than 2 factors.

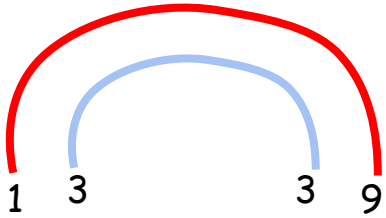
What is a composite number?

1 is neither prime nor composite number.

A composite number has more than two factors.

9 is a composite number

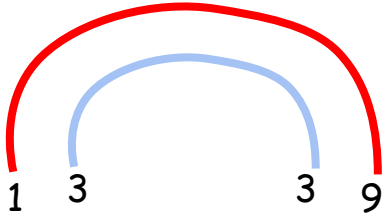
Why?



It's because 9 has more than two factors.

32 is a composite number

Why?

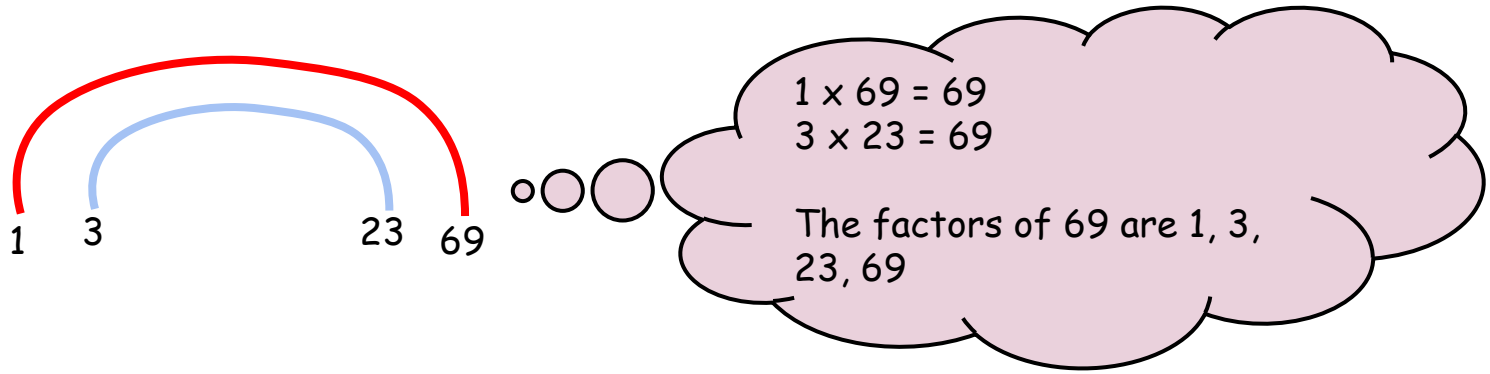


It's because 32 has more than two factors.

True or False?

"69 is a composite number."

Let's find the factors of 69 and find out if 69 is a composite number or not.

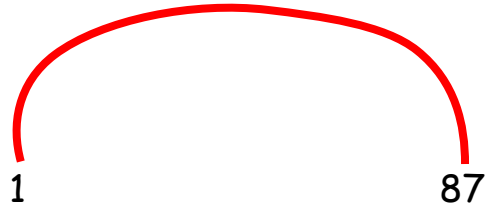


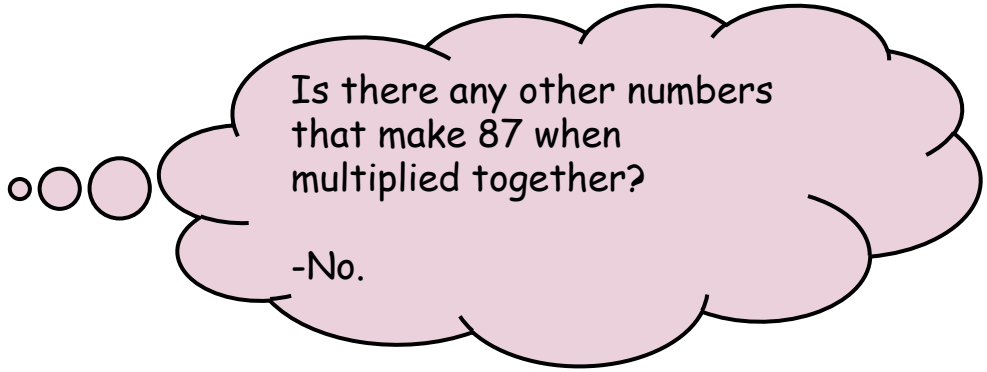
The statement is true because 69 has more than 2 factors.

True or False?

"87 is a composite number."

Let's find the factors of 87 and find out if 87 is a composite number or not.

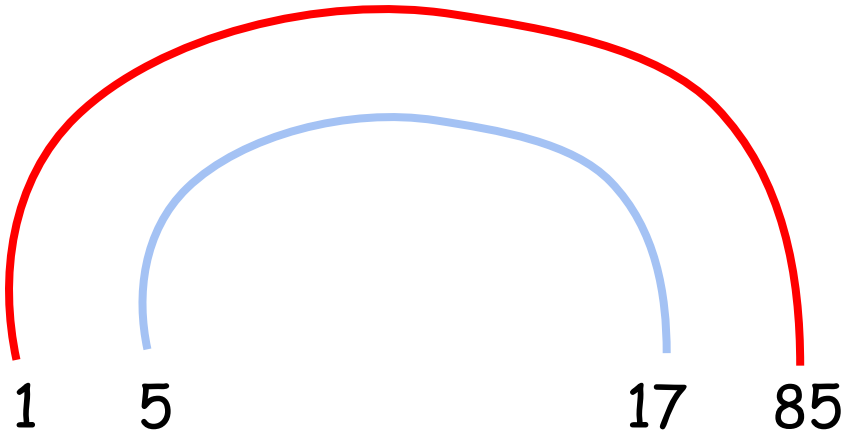




The statement is false because 87 has only two factors.

Let's try...

Is 85 a prime or composite number?



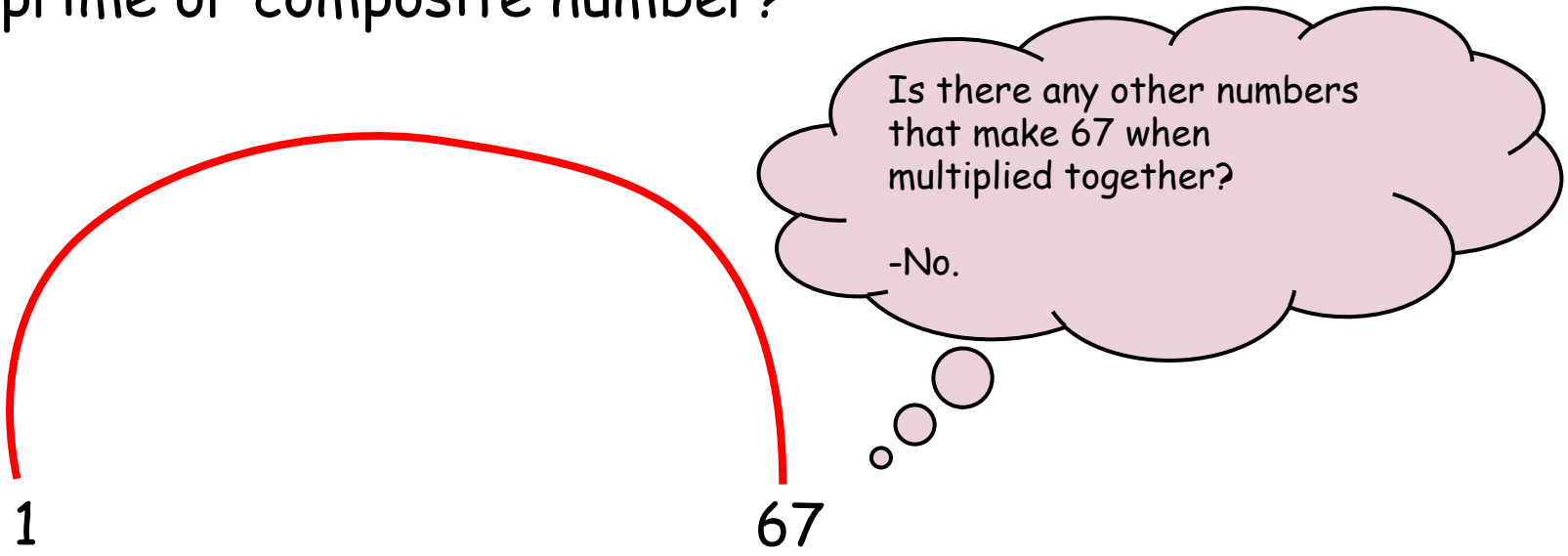
1 x 85 = 85
5 x 17 = 85

The factors of 85 are 1, 5, 17, 85

Answer: 85 is a composite number.

Let's try...

Is 67 a prime or composite number?



Answer: 67 is a prime number.