

Divisibility tests

These are simple tricks to test what a number can be shared by .

We are going to learn tricks for testing if a number can be shared by 2, 3, 4, 5, 6, 8, 9, and multiples of 10.

Divisibility tests

This is a typical SATs question that can be solved by divisibility tests.

$$\square \times \square \times \square = 150$$

Here we are asked to list 3 numbers that can be multiplied to make 150. Think about it. We will come back to this question after we learn our skills.

Divisibility tests

Divisible by 2?

If a number is divisible by 2...

Divisibility tests

Divisible by 2?

If a number is divisible by 2...

It ends with 2, 4, 6, 8, or 0

(in other words it's an EVEN number.)

Divisibility tests

Divisible by 3?

If a number is divisible by 3...

Divisibility tests

Divisible by 3?

If a number is divisible by 3...

It's digit sum is 3, 6, or 9.

The digit sum is when you add the digits in the number repeating until you get to 1 digit.

Divisibility tests

Divisible by 3?

So the number 1467 has a digit sum of 9

$$1 + 4 + 6 + 7 = 18 \quad \text{then} \quad 1 + 8 = 9$$

So 1467 is divisible by 3.

Divisibility tests

Divisible by 4?

If a number is divisible by 4...

Divisibility tests

Divisible by 4?

If a number is divisible by 4...

If we half the number, and the result is even, then our number is divisible by 4.

Divisibility tests

Divisible by 4?

If a number is divisible by 4...

If the last 2 digits of a number are divisible by 4, then our number is as well.

4 655 7**28** is divisible by 4 because **28** is divisible by 4.

Divisibility tests

Divisible by 5?

If a number is divisible by 5...

Divisibility tests

Divisible by 5?

If a number is divisible by 5...

It ends with a 5 or a 0.

5, 10, 15, 20, 25, 30, ...

Divisibility tests

Divisible by 6?

If a number is divisible by 6...

Divisibility tests

Divisible by 6?

If a number is divisible by 6...

It passes the tests for both divisibility by 2 and divisibility by 3.

In other words - an EVEN number with digit sum 3, 6 or 9

Divisibility tests

Divisible by 7?

If a number is divisible by 7...

Divisibility tests

Divisible by 7?

If a number is divisible by 7...

It appears in the 7 times table!

Sorry! You'll just have to learn it because there is no trick for 7s!

Divisibility tests

Divisible by 8?

If a number is divisible by 8...

Divisibility tests

Divisible by 8?

If a number is divisible by 8...

If you halve it, and halve it again, the result is an even number.

If the last 3 digits are divisible by 8, the whole number will be.

Divisibility tests

Divisible by 8?

If a number is divisible by 8...

So 2, 560, **104** is divisible by 8 because **104** is divisible by 8.

($104 \div 2 = 52$ $52 \div 2 = 26$ 26 is EVEN.)

Divisibility tests

Divisible by 9?

If a number is divisible by 9...

Divisibility tests

Divisible by 9?

If a number is divisible by 9...

It's digit sum is 9

Divisibility tests

Divisible by 9?

If a number is divisible by 9...

It's digit sum is 9

This means it is also divisible by 3!

Divisibility tests

Divisible by 10?

If a number is divisible by 10...

It ends in a 0

Divisibility tests

Divisible by 10?

If a number is divisible by 10...

It ends in a 0

So these numbers are also divisible by 2 and 5

Divisibility tests

Divisible by 100?

If a number is divisible by 100...

It ends in a 00

Divisibility tests

Divisible by 1000?

If a number is divisible by 1000...

It ends in a 000

Divisibility tests

Divisible by 1000?

If a number is divisible by 1000...

It ends in a 000

And so on...

Divisibility tests

Divisible by ...?

2: ends with 2, 4, 6, 8, or 0

3: digit sum is 3, 6, or 9

4: halve last 2 digits and the result is even

5: ends with 5 or 0

6: ends with 2, 4, 6, 8, or 0 AND digit sum is 3, 6, or 9

7: -

8: Halve the last 3 digits twice, and the result is even.

9: digit sum is 9

10: ends with 0

Divisibility tests

Remember this question...

$$\square \times \square \times \square = 150$$

Test 150 to see what can go in the boxes.

Divisibility tests

Remember this question...

$$\square \times \square \times \square = 150$$

150 is divisible by 2, 3, 5, 6, and 10 amongst other numbers (pick any one for the first box)

Divisibility tests

Remember this question...

$$\boxed{2} \times \boxed{} \times \boxed{} = 150$$

$$150 \div 2 = 75$$

Divisibility tests

Remember this question...

$$\boxed{2} \times \boxed{} \times \boxed{} = 150$$

These must multiply to
make 75

Divisibility tests

Remember this question...

$$\boxed{2} \times \boxed{} \times \boxed{} = 150$$

Test 75 for divisibility

Divisibility tests

Remember this question...

$$\boxed{2} \times \boxed{} \times \boxed{} = 150$$

75 is divisible by 3 and 5 among others (pick either for second box).

Divisibility tests

Remember this question...

$$\boxed{2} \times \boxed{3} \times \boxed{} = 150$$

$$75 \div 3 = 25$$

Divisibility tests

Remember this question...

$$\boxed{2} \times \boxed{3} \times \boxed{25} = 150$$

This is one solution. Can you think of others?