Learning as easy as 123

## Divisibility Rules on the ISEE <br> All Levels

LESSON GOAL: Be able to determine if a number is divisible by another number in one minute or less.

ISEE Question: Which whole number is divisible by 9 without a remainder?
A) 2,001
B)2,003
C)2,005
D) 2,007

Solution: A number is divisible by a given factor if that factor fits into it evenly, without a remainder. For example, 27 is divisible by 3 and 9 . We can solve this problem by using the divisibility rules. For this problem we only need the rule for 9 s , but it's helpful to know the rules for all the numbers:

## Examples:

2: Any even number is divisible by 2. Just look at the last digit!

3: Add all the digits together. If the sum of the digits is divisible by 3 , number is divisible by 3.

4: If the last two digits of any number are divisible by 4, the entire number is divisible by 4.

5: If the digit is 0 or 5 , the entire number is divisible by 5 .
6: If the number is even and divisible by 3 , it's also divisible by 6 .

8: If the last three digits of any number are divisible by 8 , the entire number is divisible by 8.

9: Add the digits together. If all the sum of the digits is divisible by 9 , the entire number is divisible by 9 .

10: If the last digit of a number is 0 , it's divisible by 10 .
$\underline{2} 2 \underline{2} \quad \underline{2}, 012,98 \underline{6}$

21: $2+1=3$
54: $5+4=9$
2,985: $2+9+8+5=24$
$205 \underline{20} \quad 2,012,9 \underline{84}$
$20 \quad 525 \quad 2,012,985$
$24 \quad 528 \quad 2,988$
$1,8482,097,160$

27: $2+7=9$
2007: $2+0+0+7=9$
40 1,340 1,234,560

There is no good rule for 7 or 13 , but if you use process of elimination you shouldn't have to do the calculation. Check for the easiest factors first!

Helpful Tips: Any number that's divisible by an even number ( $2,4,6,8$, etc.) MUST be even. Also, if a number is divisible by one factor, it's also divisible by all the factors of that factor. For example, any number divisible by 12 is also divisible by 2,3 , 4 , and 6.

SOLUTION: Using the 9 s rule, add the digits. D $(2,007)$ adds up to 9 , so that's the answer.

