

Divisibility Rules on the ISEE 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 9s, 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!

2 28 2,012,986

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

21: $2 + 1 = 3$

54: $5 + 4 = 9$

2,985: $2 + 9 + 8 + 5 = 24$

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

20 528 2,012,984

5: If the digit is 0 or 5, the entire number is divisible by 5.

20 525 2,012,985

6: If the number is even and divisible by 3, it's also divisible by 6.

24 528 2,988

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

1,848 2,097,160

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

27: $2 + 7 = 9$

2007: $2 + 0 + 0 + 7 = 9$

10: If the last digit of a number is 0, it's divisible by 10.

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