One of my students brought this problem from his practice test.

Resource : Veritas Prep Question Pool #1004.0

GMAT Question Pool #1004.0

Exam Results

)m 0 to 60: **Quantitative** = 38 **Verbal** = 34 **Integrated Reasoning** = 2

l from 200 to 800: **590**

$\frac{3^{-11}}{2}+\frac{3^{-12}}{4}+\frac{3^{-13}}{6}$ is how many times 3^{-14}?

- A $\frac{1}{36}$
- B 21
- C $\frac{65}{4}$
- D 24
- E $\frac{251}{6}$

Time Spent on this problem: 01:40

Explanation:

Solution: C. Exponent problems built on addition or subtraction, and that have prohibitively high exponents (i.e., values that are far too large to calculate), often revolve around factoring. Before you can factor this expression, though, you must find a common denominator.

Use 12 as the common denominator and rewrite the expression as $\frac{(6\,3^{-11})+(3\,3^{-12})+(2\,3^{-13})}{12}$

Factor out 3^{-11} from each of the terms in the numerator: $3^{-11}\frac{6+(3\,3^{-1})+(2\,3^{-2})}{12}$

Simplify to $3^{-11}\frac{6+1+\frac{2}{9}}{12}$, and add the values in the numerator to arrive at $\frac{3^{-11}(\frac{65}{9})}{12}$

My approach is different. I will use an equation because it's more flexible to handle.

1. Let's express the given question mathematically using a variable x.

$$\frac{3^{-11}}{2}+\frac{3^{-12}}{4}+\frac{3^{-13}}{6}=x\cdot 3^{-14}$$

2. What most bother you? Negative exponents?? Then let's get rid of those. How?

$$3^{14}(\frac{3^{-11}}{2}+\frac{3^{-12}}{4}+\frac{3^{-13}}{6})=x\cdot 3^{-14}\cdot 3^{14}$$

$$\Leftrightarrow \frac{3^3}{2}+\frac{3^2}{4}+\frac{3^1}{6}=x$$

3. I believe that you can solve for x.