Think of a number, double it, then add 3. Multiply your answer by 4 and take away 5. Now take away the number you first thought of. No matter what the first number was, your answer will be a multiple of:

A 2   **B** 3   **C** 5   **D** 7   **E** 11   (UK *Intermediate Mathematical Challenge,* 2003)

The trick to solving this problem is to choose a variable, let's call it a, to represent a generic number we might think of. Now we can follow the instructions step by step.

1. Think of a number → a
2. Double it → $2a$
3. Add 3 → $2a + 3$
4. Multiply the answer by 4 → $4(2a + 3)$
5. Take away 5 → $4(2a + 3) - 5$
6. Take away the initial number → $4(2a + 3) - 5 - a$

Now let's simplify the resulting expression:

$$4(2a + 3) - 5 - a = 8a + 12 - 5 - a = 7a + 7.$$

As we can see, both terms of the simplified expression have the number 7 as a factor and can thus be divided by 7. Our final answer is D.