

November 20th

Choose an integer less than 10.
Multiply by 8547.
Then multiply your result by 13.

Repeat for two other numbers.

What do you notice? Explain why this happens.

Examples:

$$9 \times 8547 = 76,923$$

$$76,923 \times 13 = 999,999$$

$$7 \times 8547 = 59,829$$

$$59,829 \times 13 = 777,777$$

$$3 \times 8547 = 25,641$$

$$25,641 \times 13 = 333,333$$

This works because $8547 \times 13 = 111,111$

Any similar question simply involves finding factor pairs of a repunit.

(A repunit is a number consisting of only 1s)