Multiplying By 142857:

A. Multiplying by 142857 can be difficult, but with a little practice it becomes quite easy. There are a few things you should remember:
   1. 142857 = $^{1}/_{7}$ x 999,999. So when multiplying n x 142857 you should first divide by 7, (n DIV 7) and if the remainder (n MOD 7) is not 0, then write this number down.
   2. The last numbers depend on the remainder (n MOD 7):
      a. 1 => 142857 – (n DIV 7)
      b. 2 => 285714 – (n DIV 7)
      c. 3 => 428571 – (n DIV 7)
      d. 4 => 571428 – (n DIV 7)
      e. 5 => 714285 – (n DIV 7)
      f. 6 => 857142 – (n DIV 7)
      g. 0 => 1,000,000 – (n DIV 7). If the remainder is 0 then the first number is (n DIV 7) – 1.
   3. These numbers are easy to remember because if you notice the number 142857 and look at the numbers in (a.) – (f.), you will notice that the numbers just wrap around.

      Ex [1] 13 x 142857 =_____.
      a) 13 DIV 7 = 1.
      b) 13 MOD 7 = 6.
      c) Write down 1 since the remainder is not 0.
      d) Since the remainder is 6 the next numbers are 857142 – 1.
      e) The answer is 1857141.

      Ex [2] 77 x 142857 =_____.
      a) 77 DIV 7 = 11.
      b) 77 MOD 7 = 0.
      c) Write down 10 since the remainder is 0.
      d) The next numbers are 1,000,000 – 11.
      e) The answer is 10999989.