Mathematics in your head – multiplication

1. Fundamentals: mental multiplication

   Two by ones

   20 x 7 = 7 x 2 x 10 = 14 x 10 = 140
   23 x 7 = 7 x 20 + 7 x 3 = 140 + 21 = 161
   87 x 8 = 8 x 80 + 8 x 7 = 640 + 56 = 640 + 50 + 6 = 690 + 6 = 696
   53 x 6 = 6 x 50 + 6 x 3 = 300 + 18 = 318

   You try

   87 x 5
   73 x 6

   More difficult

   28 x 9 = 9 x 20 + 8 x 9 = 180 + 72 = 200 + 52 = 252

   You try
   What is the area of a triangle with the base of 59” and height of 14”?

   Using complements

   7 x 59 = 7 x 60 – 7 = 420 – 7
   78 x 4 = 80 x 4 – 2 x 4 = 320 – 8

   Distributive law

   3 x 87 = 261
   3 x 87 = 3 x 80 + 3 x 7 = 240 + 21 = 261
   7 x 324 = 7 x 300 + 7 x 20 + 7 x 4 = 2100 + 140 + 28 = 2240 + 28 + 2268

   Three by one problems
   7 x 300 = 2100
   7 x 320 = 7 x 300 + 7 x 20 = 2100 + 140 = 2240
   7 x 324 = 7 x 300 + 7 x 20 + 7 x 4 = 2100 + 140 + 28 = 2240 + 28 + 2268

You try
How many days occur in a 6 year period?

When zero is in the middle, you can start saying your answer while calculating the rest
402 x 9 = 36 hundred 18

Same when there is one in the middle
812 x 3 = 24 hundred 36

When there is a 5 multiplied by an even number
521 x 8 = 4 thousand 21 x 8 = 4000 + 160 + 1 x 8 = 4168

925 x 8 = 8 x 900 + 25 x 8 = 7200 + 200 = 7400

You try
789 x 7 =

Another way
789 x 7 = 800 x 7 – 11 x 7 =

2. Two by twos

Factorization

23 x 16 = 23 x 8 x 2 = (160 + 24) x 2 = 184 x 2 = 368

Associative law of multiplication

23 x 16 = 23 x 4 x 4 = 92 x 4 = 360 + 8 = 368

You try
Suppose your phone service cost you $59 per month, how much will you pay for one year?

Suppose a swimming pool is 14 ft by 14 ft by 7 ft. How many cubic feet is the volume of the pool?