**Addition, Subtraction, Multiplication:**

1. Rounding 1: When w multiplying numbers that are easily rounded up such as ending 8 or 9, use the subtraction method. For example, 49 x 16:
   1. Round up 49 to 50;
   2. 50 x 16 = 800
   3. 49 x 16 = 50 x 16 – 1 x 16 = 784
2. Rounding 2: For some subtractions, do additions first then subtract. For example, 632 – 478:
   1. Round up 478 to 500;
   2. 632 – 500 = 132;
   3. 632 – 478 = 632 – 500 + 22 = 132 + 22 = 154
3. For some additions, do rounding first. For example 76 + 81:
   1. Round up 81 to 90;
   2. 76 + 90 = 166;
   3. 76 + 81 = 76 + 90 – 19 = 166 – 19 = 147
4. The add/subtract method for squaring: example 46 x 46
   1. 46 x 46 = (46 – 4) x (46 + 4) + 16 = 42 x 50 + 16 = 2116
5. Squaring double-digit numbers ending in 5: For example, x5
   1. X5 \* x5 = x \* (x + 1) \* 100 + 25
6. Binomial Theorem for squaring: ab x ab

* (10a + b) x (10a + b) = 100 x a x a + 2 x 10 x a x b + b x b
* 41 x 41 = 40 x 40 + 2 x 40 x 1 + 1 = 1681

1. Multiplying by 5 equals to multiplying by 10 then divide by 2:
   1. 79 \* 5 = 79 x 10 / 2 = 395
2. Multiplying by 11:
   1. 42 x 11 = 400 + (4 + 2) x 10 + 2 =462
   2. 89 x 11 = 800 + (8 + 9) x 10 + 9 = 979
3. For two digit number multiplications, if the tenth digits are the same and the sum of the unit digits equals to 10, then xy \* xz = x \* (x + 1) \* 100 + y \* z:
   1. 82 \* 88 = 8 \* 9 \* 100 + 2 \* 8 = 7216
4. Redistribution numbers: 49 + 96
   1. 49 + 96 = 50 – 1 + 95 + 1 = 145
5. Divide and conquer: 25 x 16
   1. 25 x 32 = 25 x 4 x 8 =800
6. Use 5 x 2, 25 x 4, 125 x 8 combinations