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Aptitude Made Simple

Multiplication Shortcut Tricks

How much time you will need to calculate answer

1) 99 * 99
2) 786 * 785
3) 76 * 45
4) 689 * 546
5) 38 * 777
6) 88 * 88

Solving any mathematics problems quickly needs calculation of Multiplication, Squares etc. More time we need to do calculations, more time we will take to solve any math problem.

What if you can calculate square or multiplications less than 20 seconds and with good practice orally as well?

We can reduce our problem solving time for each question as 90% of problem need multiplication whether it is Work and Time , Profit and Loss, Percentage, Compound Interest or any other topic.

We will see simple tricks to calculate:

Multiplication

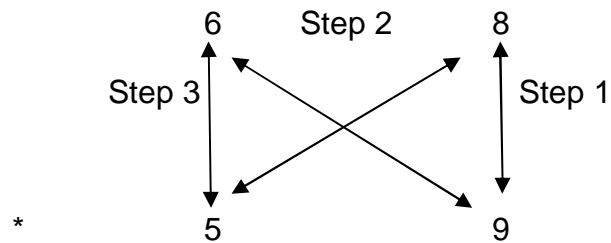1) 2 digit number * 2 digit number
2) 3 digit number * 3 digit number
3) 2 digit number * 3 digit number
4) 3 digit number * 2 number

1) Type 1: 2 digit number * 2 digit number
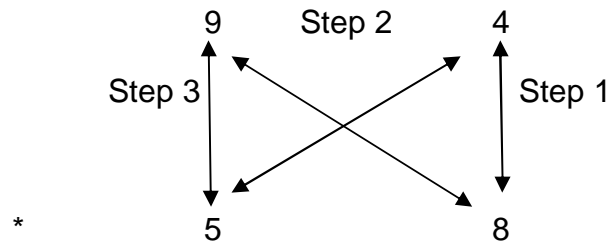
Problem 1:

68 * 59

Solution:

*   5   9

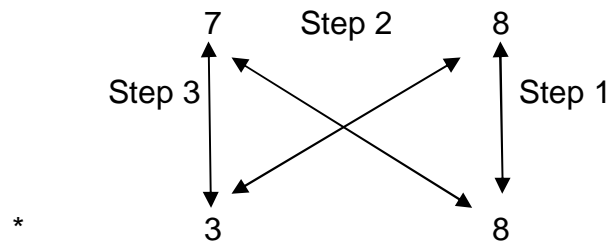| Step	Description	Calculation	Answer
Step 1	Multiply rightmost 2 digits	8 * 9 = 72 [write 2 and **carry 7**]	2
Step 2	Multiply diagonal digits and add them.	(6 * 9) + (8 * 5) =54 + 40 = 94 94 + Previous carry 94 + 7 = 10**1** [write 1 and **carry 10**]	12
Step 3	Multiply left most 2 digit	6 * 5 = 30 30 + Previous carry 30 + 10= **40**	4012

Answer is 4012

Problem 2:

94 * 58

Solution:

```
        9      Step 2       4
                             
  Step 3  ↑  ↘         ↗  ↑  Step 1
          │     ╲   ╱      │
          │      ╲ ╱       │
          │      ╱ ╲       │
          ↓  ↙         ↘  ↓
*         5                8
```

Step	Description	Calculation	Answer
Step 1	Multiply rightmost 2 digits	4 * 8 = 3**2** [write 2 and **carry 3**]	2
Step 2	Multiply diagonal digits and add them.	(9 * 8) + (4 * 5) = 72 + 20 = 92 92 + Previous carry 92 + 3 = 9**5** [write 5 and **carry 9**]	52
Step 3	Multiply left most 2 digit	9 * 5 = 45 45 + Previous carry 45 + 9= **54**	5452

Answer is 5452

Problem 3:

78 * 38

Solution:

```
   7        Step 2        8
      ↗↖                ↗↑
Step 3 │  ✕              │ Step 1
      ↓ ↙            ↘ ↓
*        3              8
```

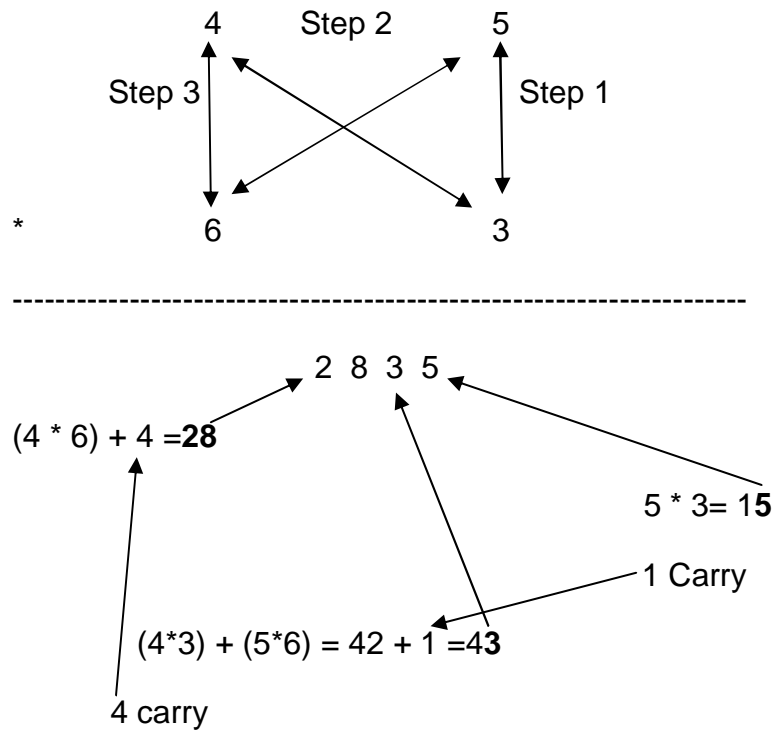| Step	Description	Calculation	Answer
Step 1	Multiply rightmost 2 digits	8 * 8 = 6**4** [write 4 and **carry 6**]	4
Step 2	Multiply diagonal digits and add them.	(7 * 8) + (8 * 3) = 56 + 24 = 80 80 + Previous carry 80 + 6 = 8**6** [write 6 and **carry 8**]	64
Step 3	Multiply left most 2 digit	7 * 3 = 21 21 + Previous carry 21 + 8= **29**	2964

Answer is 2964

Now will solve next 2 problems orally in single line
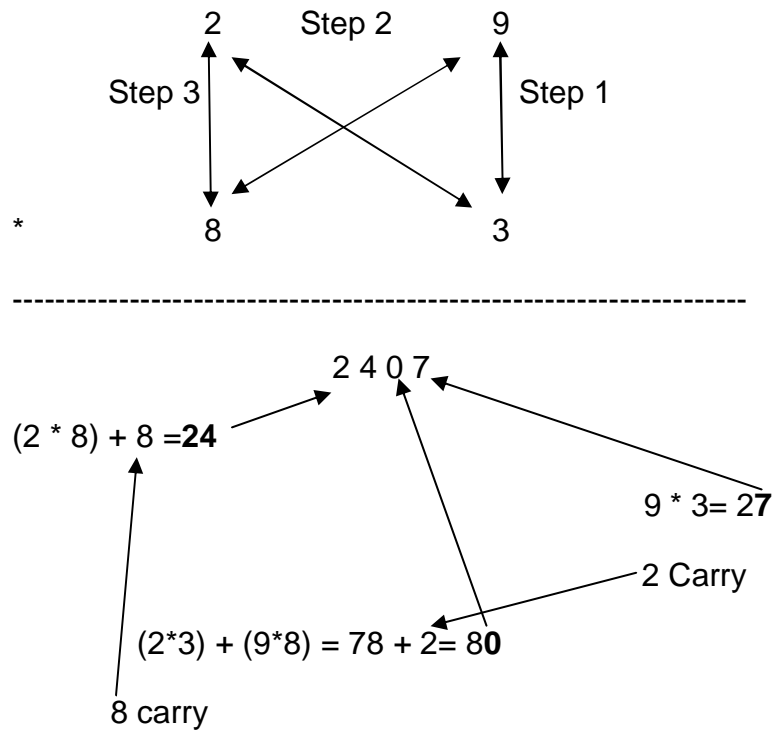
Problem 4:

45 * 63

Solution:

```
        4      Step 2      5
  Step 3                       Step 1
        6                  3
```

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2 8 3 5

(4 * 6) + 4 =**28**

5 * 3= 1**5**

1 Carry

(4*3) + (5*6) = 42 + 1 =4**3**

4 carry

Answer is 2835

Problem 5:

29 * 83

Solution:

```
      2        Step 2        9
           ↖           ↗
  Step 3 │      ✕         │ Step 1
           ↙           ↘
      8                 3
*
```

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                        2 4 0 7

(2 * 8) + 8 =**24**

                                        9 * 3= 2**7**

                                    2 Carry

        (2*3) + (9*8) = 78 + 2= 8**0**

    8 carry

Answer is 2407

Type 2: 3 digit number * 3 digit number

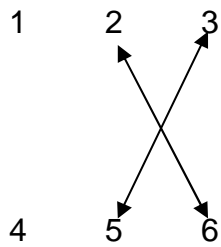   **Problem 1:**

  123* 456

   Solution:

[Right-Most 2 digit]   [Diagonally right 2] [Extreme diagonal n middle 2 digits]
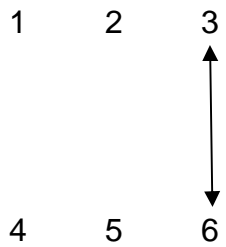
   Step 1:   Step 2:   Step 3:

```
1      2      3        1      2      3        1      2      3




4      5      6        4      5      6        4      5      6
```


[Diagonally left 2]   [Left-Most 2 digit]

Step 4:   Step 5:

```
1      2      3        1      2      3




4      5      6        4      5      6
```
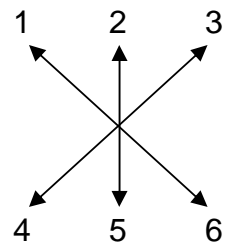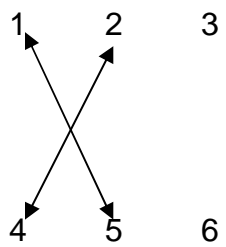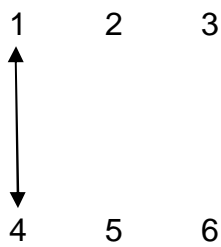
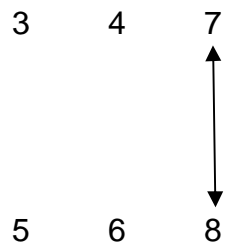| Step	Description	Calculation	Answer
Step 1	Multiply Right-Most 2 digit	3 * 6 = 18 [write 8 and **carry 1**]	8
Step 2	Multiply right side diagonal digits and add them.	(2 * 6) + (3 * 5) = 12 + 15 = 27 27 + Previous carry 27 + 1 = 2**8** [write 8 and **carry 2**]	88
Step 3	Multiply extreme diagonal 2 digit , middle digits and add them	(1*6)+ (3*4) +(2*5) = 28 28 + Previous carry 28 + 2= 3**0** [write 0 and **carry 3**]	088
Step 4	Multiply left side diagonal digits and add them.	(1*5)+(2*4) =13 13 + Previous carry 13 + 3= 1**6** [write 6 and **carry 1**]	6088
Step 5	Multiply Left Most 2 digits	1* 4= 4 4 + Previous carry 4 + 1 = **5**	56088

Answer is 56088

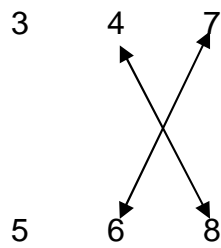**Problem 2:**
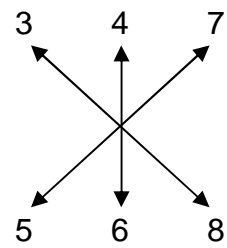
347 * 568

Solution:

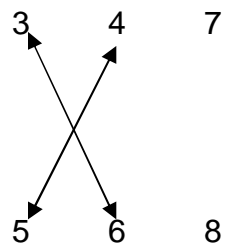[Right-Most 2 digit]   [Diagonally right 2]   [Extreme diagonal n middle 2 digits]

    Step 1:   Step 2:   Step 3:

3   4   7   3   4   7   3   4   7

5   6   8   5   6   8   5   6   8

[Diagonally left 2]   [Left-Most 2 digit]

Step 4:   Step 5:

3   4   7   3   4   7

5   6   8   5   6   8

Step	Description	Calculation	Answer
Step 1	Multiply Right-Most 2 digit	7 * 8 = 5**6** [write 6 and **carry 5**]	6
Step 2	Multiply right side diagonal digits and add them.	(4 * 8) + (7 * 6) = 32 + 42 = 74 74 + Previous carry 74 + 5 = 7**9** [write 9 and **carry 7**]	96
Step 3	Multiply extreme diagonal 2 digit , middle digits and add them	(3*8)+ (7*5) +(4*6) = 24 + 35 + 24 = 83 83 + Previous carry 83 + 7= 9**0** [write 0 and **carry 9**]	096
Step 4	Multiply left side diagonal digits and add them.	(3*6)+(4*5) =38 38 + Previous carry 38 + 9= 4**7** [write 7 and **carry 4**]	7096
Step 5	Multiply Left Most 2 digits	3* 5= 15 15 + Previous carry 15 + 4 = **19**	197096

Answer is 197096

Problem 3:

249 * 871

Solution:

[Right-Most 2 digit]   [Diagonally right 2]   [Extreme diagonal n middle 2 digits]

      Step 1:   Step 2:   Step 3:
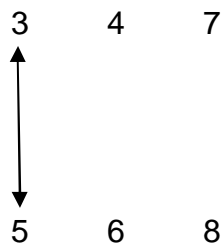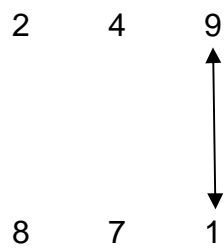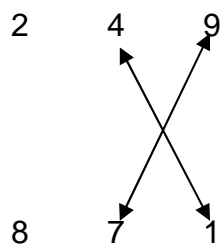
2   4   9   2   4   9   2   4   9

8   7   1   8   7   1   8   7   1

[Diagonally left 2]   [Left-Most 2 digit]

Step 4:   Step 5:

2   4   9   2   4   9

8   7   1   8   7   1
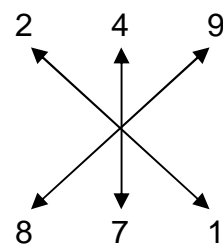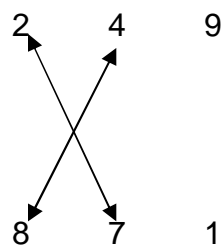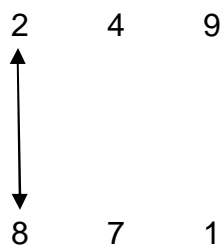
Step	Description	Calculation	Answer
Step 1	Multiply Right-Most 2 digit	9 * 1 = 9 [write 9]	9
Step 2	Multiply right side diagonal digits and add them.	(4 * 1) + (9 * 7) = 4 + 63 = 67 67 + Previous carry 67 + 0 = 6**7** [write 7 and **carry 6**]	79
Step 3	Multiply extreme diagonal 2 digit , middle digits and add them	(2 * 1)+ (9 * 8) +(4 * 7) = 2 + 72 + 28 = 10**2** 102+ Previous carry 102 + 6 = 10**8** [write 8 and **carry 10**]	879
Step 4	Multiply left side diagonal digits and add them.	(2 * 7)+(4 * 8) = 46 46 + Previous carry 46 + 10= 5**6** [write 6 and **carry 5**]	6879
Step 5	Multiply Left Most 2 digits	2 * 8 = 16 16 + Previous carry 16 + 5 = 21	216879

Answer is 216879

Now will solve next 2 problem orally in single line

Problem 4:

145 * 963

Solution:

1	4	5
* 9	6	3

---

1 3 9 6 3 5

(1*9)=9 + 4 =13

(1*6) +(4*9)= 42 + 7 = 4**9**   1**5** **[**5 * 3**]**

Carry 4   Carry 1

[(1 * 3)+(5 * 9)+(4 * 6)=72 and 72 + 4] =7**6**

Carry 7

(4 * 3) + (5 * 6) = 42 and 42 + 1 = 4**3**

Carry 4

Answer is 139635

Problem 5:

293 * 829

Solution:

          2   9   3

*   8   2   9

---

                              2   4   2   8   9   7

(2*8)=16 + 8 =**24**

 (2*2) +(9*8)= 76 + 6 = 8**2**   2**7** [3 * 9]

Carry 8   Carry 2

 [(2 * 9)+(3 * 8)+(9 * 2)=60 and 60 + 8] =6**8**

 Carry 6

                              (9 * 9) + (2 * 3) = 87 and 87 + 1 = 8**9**

                              Carry 8

Answer is 242897

Type 3: 2 digit number * 3 digit number

Problem 1:

45 * 963

Solution: Just add extra 0 to 2 digit number and follow same procedure

0	4	5
* 9	6	3

4   3   3   3   5

(0*9)=0 + 4 =4

(0*6) +(4*9)= 36 + 7 = 4**3**

Carry 4

15 **[**5 * 3**]**

Carry 1

[(0 * 3)+(5 * 9)+(4 * 6)=69 and 69 + 4] =7**3**

Carry 7

(4 * 3) + (5 * 6) = 42 and 42 + 1 = 4**3**

Carry 4

Answer is 43335

Type 4: 3 digit number * 2 digit number

Problem 1:

145 * 63

Solution: Just add extra 0 to 2 digit number and follow same procedure

	1	4	5
*	0	6	3

0 9 1 3 5

(1*0)=0 = 0

(1*6) +(4*0)= 6 + 3 = **9**

15 [5 * 3]

Carry 1

[(1 * 3)+(5 * 0)+(4 * 6)=27 and 27 + 4] =3**1**

Carry 3

(4 * 3) + (5 * 6) = 42 and 42 + 1 = 4**3**

Carry 4

Answer is 9135