

Multiplying Two Numbers That End In 5:

A. When multiplying two numbers that both end in 5, you can do the following from algebra:

$$(10a + 5)(10b + 5) = 100(ab + \frac{(a+b)}{2}) + 25, \text{ if } (a + b) \text{ is even}$$

$$100(ab + \frac{(a+b-1)}{2}) + 75, \text{ if } (a + b) \text{ is odd}$$

B. Using numbers instead of variables we get the following rules:

If $(a + b)$ is even:

1. Write down 25.
2. Multiply the ten's digits together.
3. Add the ten's digits together and divide by 2.
4. Add step 2 and step 3. Write this result.

If $(a + b)$ is odd:

1. Write down 75.
2. Multiply the ten's digits together.
3. Add the ten's digits together, subtract 1, then divide by 2.
4. Add step 2 and step 3. Write this result.

C. Examples:

Ex [1] $35 \times 55 =$ _____.

- a) Since $3 + 5$ is even, write 25.
- b) $3 \times 5 = 15$.
- c) $\frac{(3+5)}{2} = 4$.
- d) $15 + 4 = 19$. Write 19.
- e) The answer is 1925.

Ex [2] $85 \times 75 =$ _____.

- a) Since $8 + 7$ is odd, write 75.
- b) $8 \times 7 = 56$.
- c) $\frac{(8+7-1)}{2} = 7$.
- d) $56 + 7 = 63$. Write 63.
- e) The answer is 6375.

Ex [3] $125 \times 155 =$ _____.

- a) Since $12 + 15$ is odd, write 75.
- b) $12 \times 15 = 180$. See [Multiplying by 15](#) or [Double and Half](#).
- c) $(12 + 15 - 1)/2 = 13$.
- d) $180 + 13 = 193$. Write 193.
- e) The answer is 19375.

C. If you encounter a problem, as in Ex [2], where the difference of the ten's digit is 1, then you can add one to the largest ten's digit and multiply by the remaining ten's digit.

*Ex [2] $85 \times 75 =$ _____.

- a) Since $8 + 7$ is odd, write 75.
- b) $8 + 1 = 9$.
- c) $9 \times 7 = 63$. Write 63.
- d) The answer is 6375.