Shortcuts for complements:

- **(r-1)'s complements:**

  - 9's complement can be found by subtracting every digit from 9.
    Ex.- 9's complement of $(27)_{10}$ is:

    $$99 - 27 = 72 \qquad \text{[Proof: Ex. 1]}$$

  - 7's complement can be found by subtracting every digit from 7.
    Ex.- 7's complement of $(253)_8$ is:

    $$777 - 253 = 524 \qquad \text{[Proof: Ex. 2]}$$

  - 15's complement can be found by subtracting every digit from F or 15.
    Ex.- 15's complement of $(A9)_{16}$ is:

    $$15\ 15 - A\ 9$$
    $$= 15\ 15 - 10\ 9$$
    $$= 5\ 6 \qquad \text{[Proof: Ex. 3]}$$

  - 1's complement can be found by subtracting every digit from 1.
    Ex.- 1's complement of $(11011)_2$ is:

    $$11111 - 11011 = 00100 \qquad \text{[Proof: Ex. 4]}$$

- **(r)'s complements:**

  - 10's complement can be found by leaving all LSB zeros, subtracting first non-zero from 10 and then subtracting all digits from 9.
    Ex1.- 10's complement of $(27)_{10}$ is:

    $$9\ 10 - 2\ 7 = 7\ 3 \qquad \text{[Proof: Ex. 5]}$$

  - 8's complement can be found by leaving all LSB zeros, subtracting first non-zero from 8 and then subtracting all digits from 7.
    Ex.- 8's complement of $(253)_8$ is:

    $$7\ 7\ 7 - 2\ 5\ 3 = 5\ 2\ 5 \qquad \text{[Proof: Ex. 6]}$$

- o 16's complement can be found by leaving all LSB zeros, subtracting first non-zero from 16 and then subtracting all digits from 15.
  Ex.- 16's complement of $(A9)_{16}$ is:

  $$15 \quad 16 - A \quad 9$$
  $$= 15 \quad 16 - 10 \quad 9$$
  $$= 5 \quad 7 \qquad\qquad \text{[Proof: Ex. 7]}$$

- o 2's complement can be found by leaving all LSB zeros, subtracting first non-zero from 2 and then subtracting all digits from 1.
  Ex.- 2's complement of $(11011)_2$ is:

  $$11112 - 11011 = 00101 \qquad \text{[Proof: Ex. 8]}$$

Assignments: NOTHING.

Just check all the complements from formula and from shortcut.