CN-

CN^-

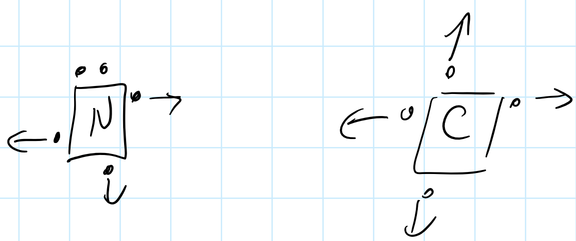
$T = 4 + 5 = 9$

$\uparrow \quad \uparrow$

C N

$T = 9 + 1 = 10$ ← charged 1−

There is no central atom - only two atoms here, but it's ok To think of C as the central atom b/c it can mk 4 bonds & N can only mk 3 bonds.

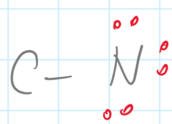


Attempt a skeleton:

C N $T = 10e^-$

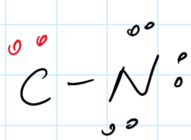
C — N $T = 10 - 2 = 8e^-$ no more atoms 2use

N could use 6 e^- to mk an 8et



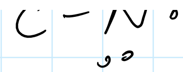
$T = 8 - 6 = 2e^-$ —‖—

C doesn't hv an 8-et, use the leftover e^-s



$T = 2 - 2 = \varnothing$ —‖—

no more



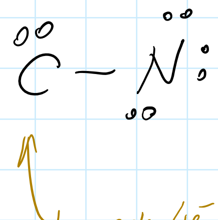
$1 = 2 - 2 = 0$

no more electrons

C has no 8et

try a doubl-bond

Snatch the $\bar{e}$s from N



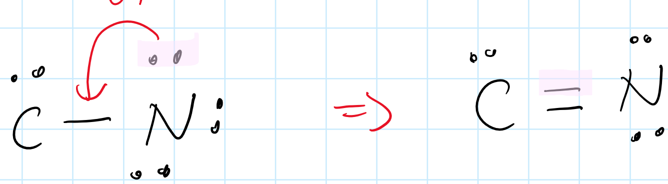
—||— —||—

has only $4\bar{e}$, not an 8et yet.
could grab $4\bar{e}$ more from a neighbour.

There is no point to take the $2\bar{e}$ from C and transform them into a double bond, that won't change the numbers of $\bar{e}$s in C, it only rearranges the lone pair C into a bond.

Taking more $\bar{e}$s from N & connecting them into an additional bond to C increases th # of $\bar{e}$s in C towards an 8-et.

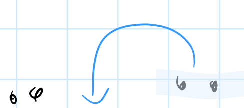
N shares $2\bar{e}$ w/ C

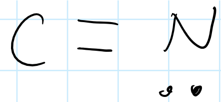


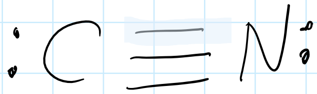
C will hv more $\bar{e}$-s towards an 8et.

Does C have an 8et now? No, there are only $6\bar{e}$s. Repeat the process:

let C aquire more $\bar{e}$s from its neighbour







now C has an 8et.

$FC(N) = 5-3-2 = \varnothing$ ← perfect

$FC(C) = 4-3-2 = -1$

not too bad, we probably can live w/ this value

Total FC in the arrangement:

$\sum FC = \underbrace{-1}_{C} + \underbrace{\varnothing}_{N} = -1$ ← this is great b/c the original formula was charged: CN^-.

∴ The correct structure is :C≡N:

and in dot only form: