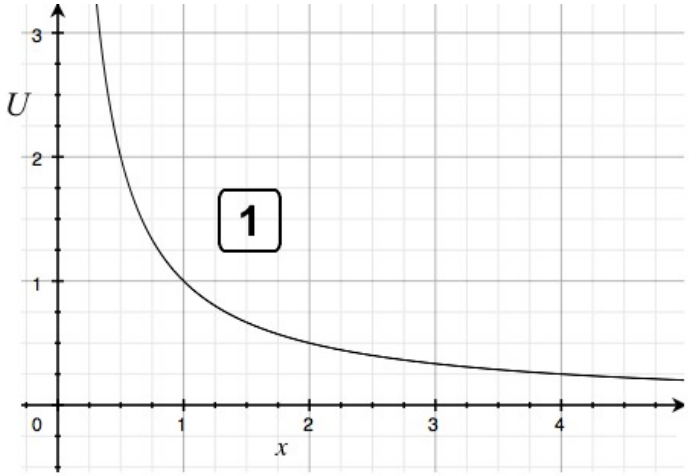
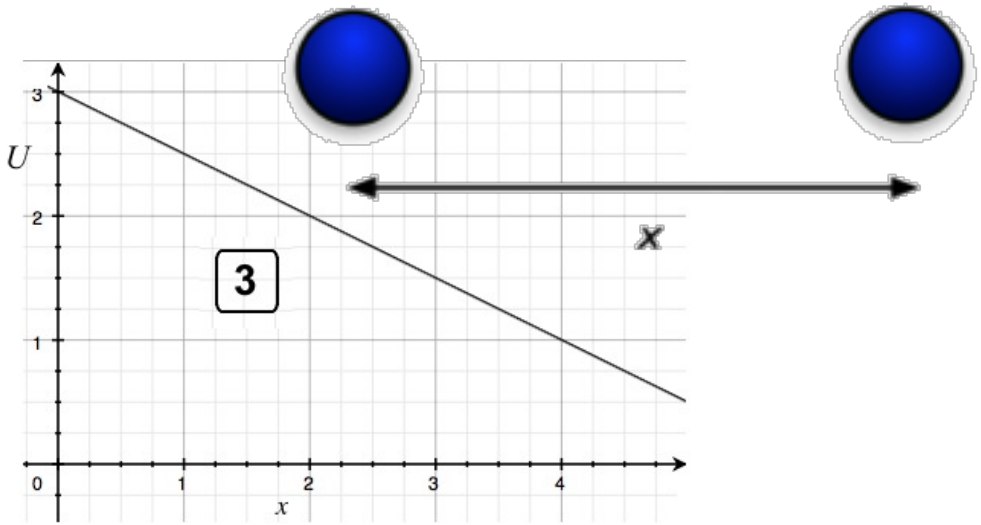
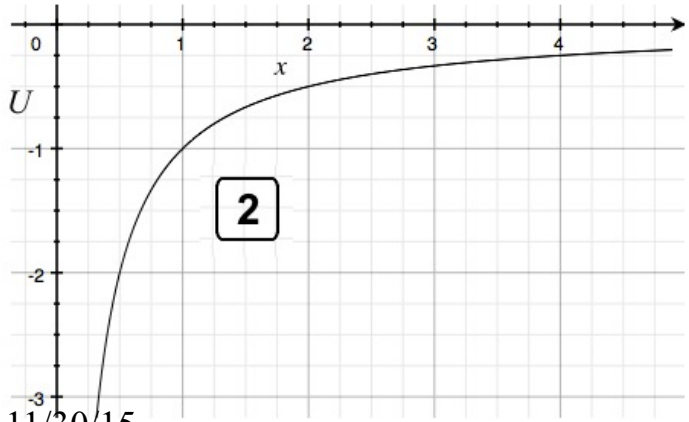
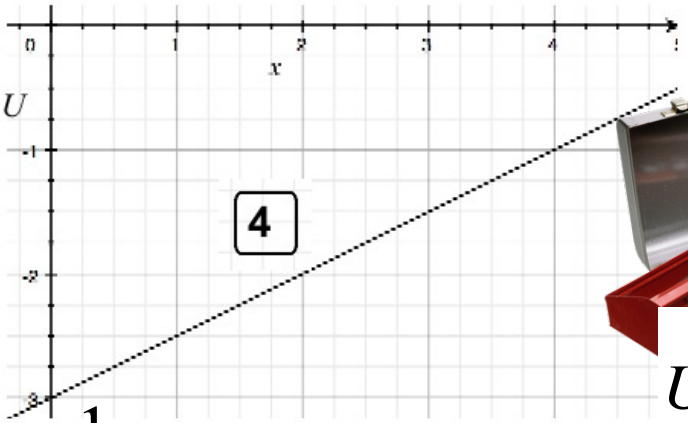
What does the electric potential energy between two identical charges look like?







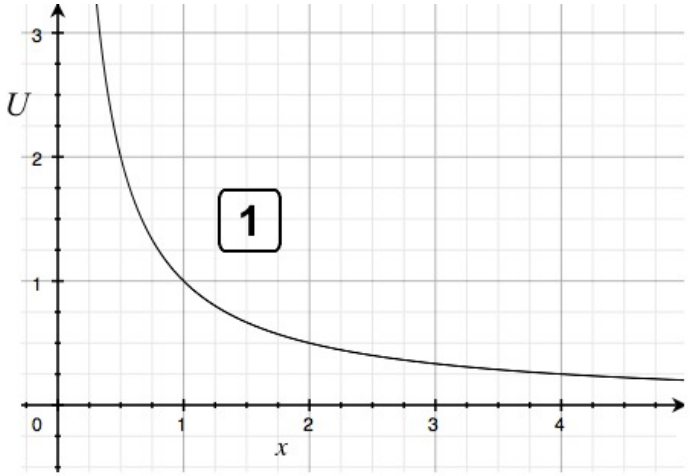


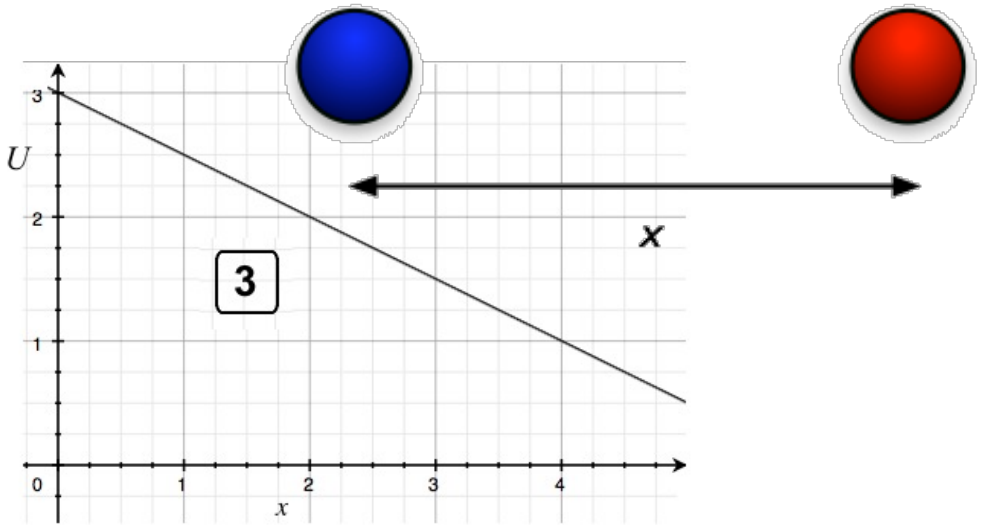
$$U^{elec} = \frac{k_C qQ}{r}$$

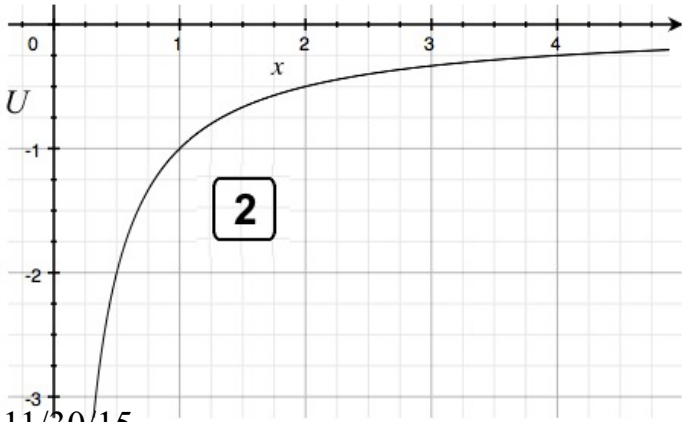
11/30/15

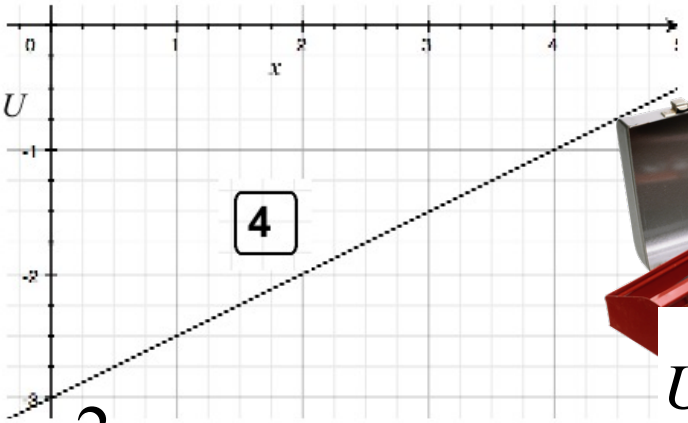
5. None of the above

What does the electric potential energy between two opposite charges look like?









$$U^{elec} = \frac{k_C qQ}{r}$$

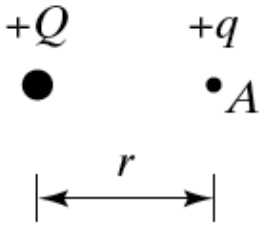
11/30/15

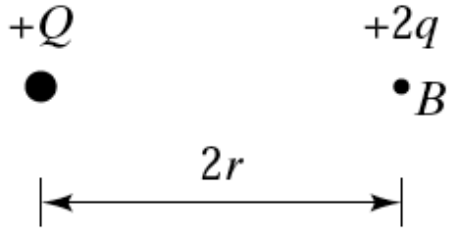
5. None of the above

Two test charges are brought separately into the vicinity of a charge $+Q$. First, test charge $+q$ is brought to point A a distance r from $+Q$.
Next, $+q$ is removed and a test charge $+2q$ is brought to point B a distance $2r$ from $+Q$.

Compared with the electrostatic potential energy of pair of charges in case A, the PE in case B is

1. greater
2. smaller
3. the same
4. you can't tell from the information given



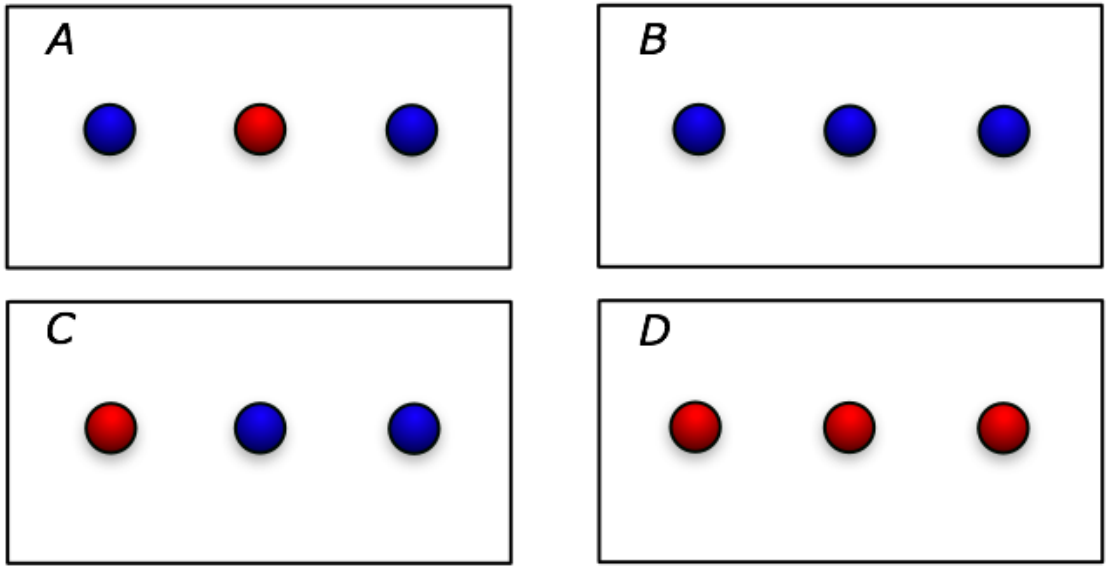


$$U^{elec} = \frac{k_C qQ}{r}$$

Which of these configurations has the largest electric PE?

charge = +q

charge = -q



1. A
2. B
3. C
4. D
5. A and C
6. B and D
7. other

$$U^{elec} = \frac{k_C qQ}{r}$$

When a positive (test) charge is released from rest near a fixed positive (source) charge what happens to the electric potential energy of the test charge?

1. It will increase because the test charge will move towards the source charge.
2. It will decrease because the test charge will move away from the source charge.
3. It will increase because the test charge will move away from the source charge.
4. It will decrease because the test charge will move towards the source charge.
5. It will remain constant because the test charge remains at rest.
6. There is not enough information to tell.

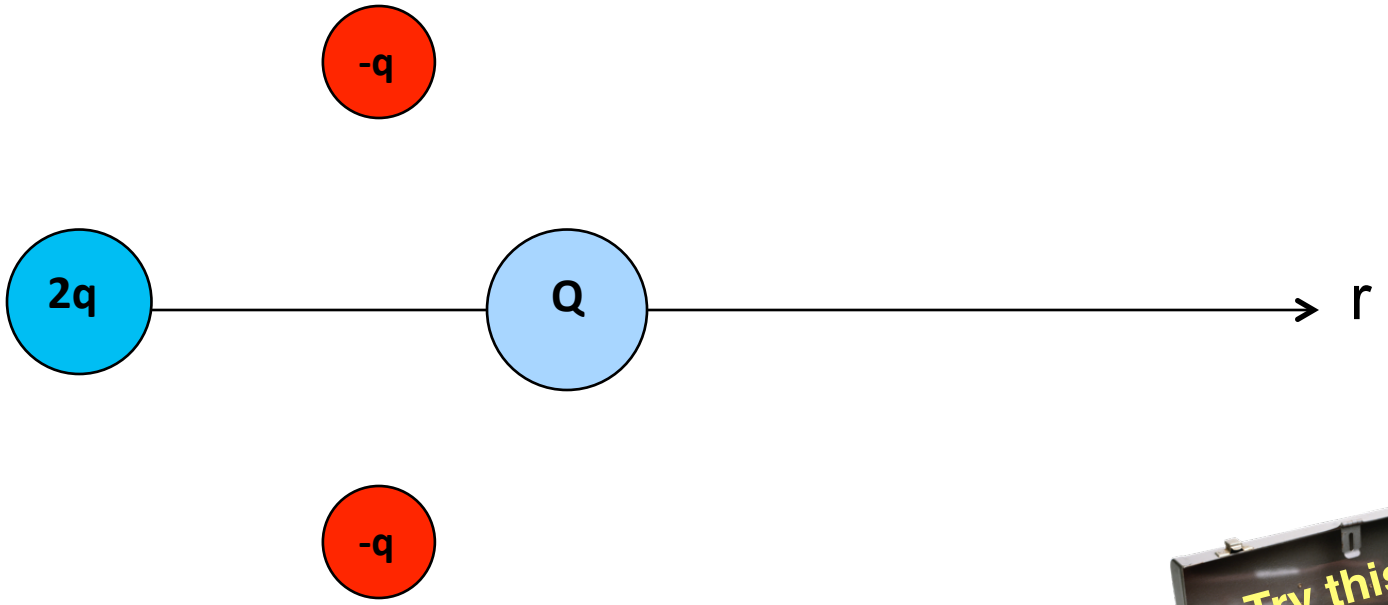
Do it with the graph!

When a negative (test) charge is released from rest near a fixed positive (source) charge what happens to the electric potential energy of the test charge?

1. It will increase because the test charge will move towards the source charge.
2. It will decrease because the test charge will move away from the source charge.
3. It will increase because the test charge will move away from the source charge.
4. It will decrease because the test charge will move towards the source charge.
5. It will remain constant because the test charge remains at rest.
6. There is not enough information to tell.

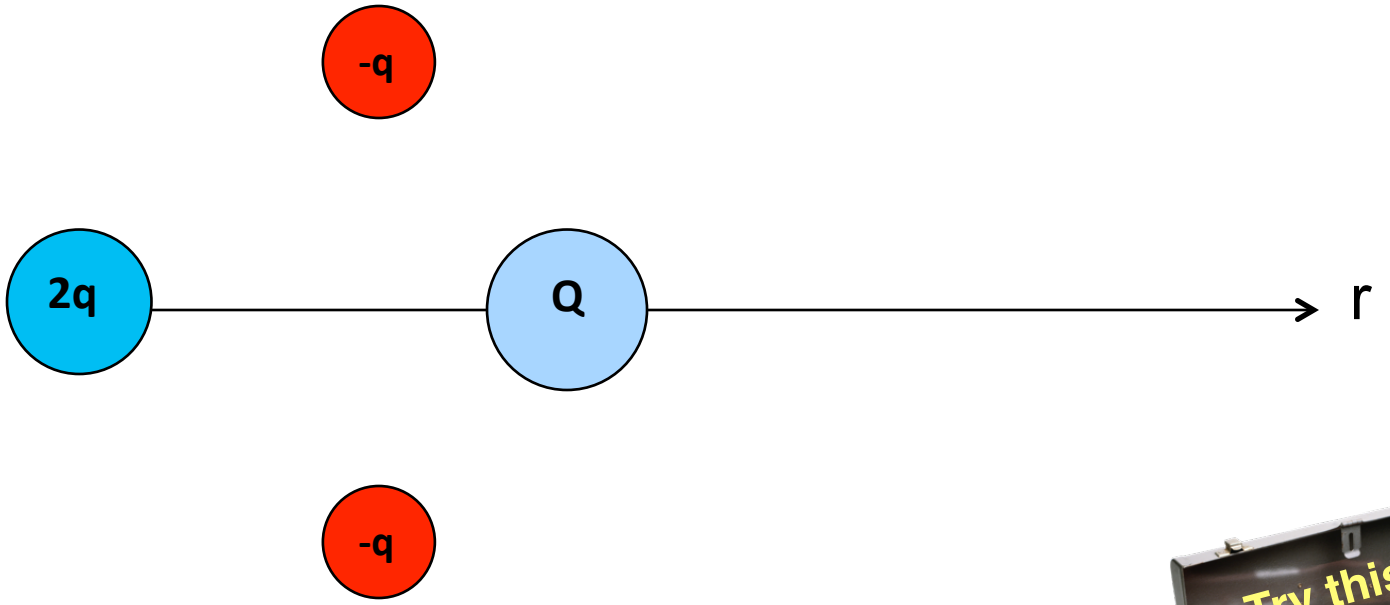
Do it with the graph!

How many interactions in the system have an electric potential energy? (Equivalently: How many "1/*r*" terms will we have to add up to get the total electric PE?)



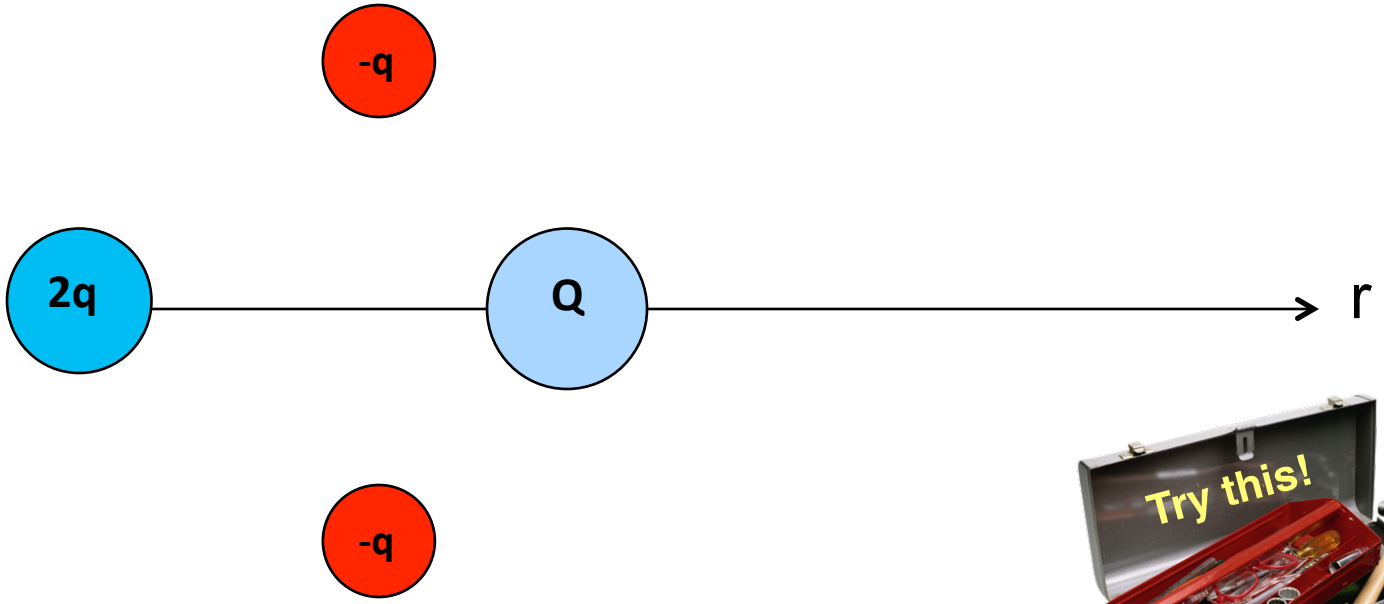
$$U^{elec} = \frac{k_C qQ}{r}$$

How many of those potential energies change when the charge *Q* moves to the right?



$$U^{elec} = \frac{k_C qQ}{r}$$

Sketch a graph of the extra potential energy from adding *Q* as a function of position *r* of charge *Q*



$$\Delta U = k_C Q \sum_{i=1}^{3} \frac{q_i}{r_{Q \to q_i}} = k_C Q \left(\frac{q_1}{r_1} + \frac{q_2}{r_2} + \frac{q_3}{r_3} \right)$$