

Flashback 2

1. Ammonium hydroxide, NH_4OH , is a common compound found in many glass cleaners. You made a sample solution of NH_4OH in the laboratory. You used 6.50 g of NH_4OH .

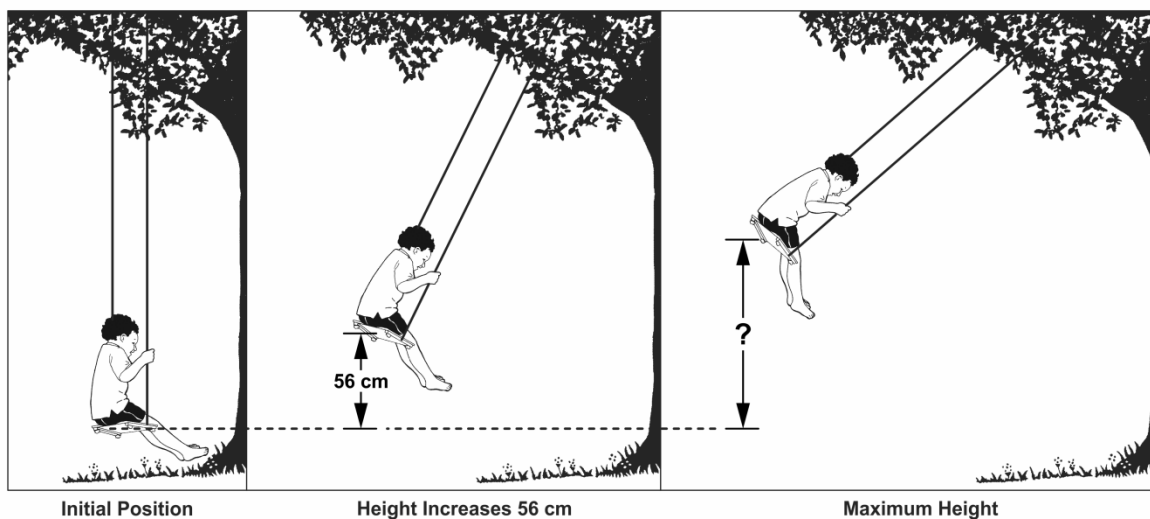
How many ions of *ammonium* are in your sample solution of NH_4OH ?

2. There is force of attraction and repulsion between two electrically charged particles at rest.

Two positively charged particles at rest exert a force of $4.6 \times 10^3 \text{ N}$ on one another. The charge of the first particle is $6.0 \times 10^{-5} \text{ C}$ and the charge of the second particle is $2.0 \times 10^{-4} \text{ C}$.

What is the distance between the two charged particles?

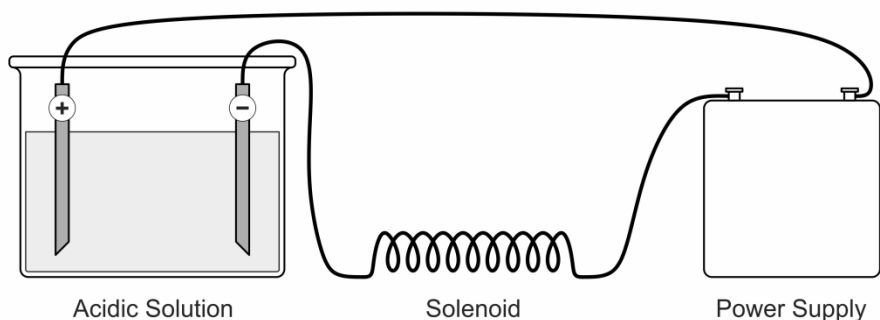
3. At the playground, Joseph is swinging on a wooden swing. When the height of the swing rose to 56 cm above the initial position, Joseph's velocity was 4.0 m/s. His mass is 45 kg.



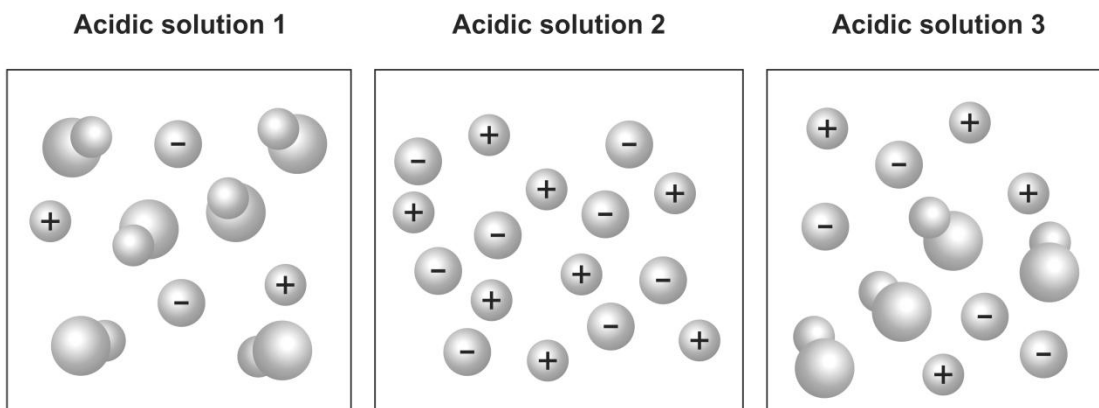
What is the maximum height above the initial position that Joseph will reach? Assume there is no friction.

Note: Significant figures will be evaluated in this question.

4. An engineering student is designing a circuit with a solenoid. The design is such that the circuit uses an acidic solution as shown below.



She wants to vary the intensity of the magnetic field of the solenoid by using three different acidic solutions which are illustrated below.



Which of the following correctly ranks the intensity of the magnetic field produced, from **strongest** to **weakest**, when each acidic solution is used in the circuit?

5. A nuclear plant in Chalk River, Ontario is responsible for producing 40% of the world's supply of medical isotopes.

At the facility, uranium-235 is used to produce molybdenum, Mo, as well as other products. One of the isotopes of molybdenum produced at Chalk River is Mo-99.

Possible isotopes of the element are:



- a) List the number of protons and neutrons found in each isotope of molybdenum.
- b) What type of nuclear transformation does the production of Mo-99 represent? Explain your answer.

