1) Deduction of ohm's law :→

Since $V_d = \frac{eE\tau}{m}$ or $V_d = \frac{eV\tau}{ml}$

Now we know that

current $I = neAV_d$

Since $E = \frac{V}{l}$, $V = Ed$

or $I = \frac{neAeV\tau}{ml}$ or $\frac{I}{V} = \frac{ne^2A\tau}{ml}$

or $\frac{V}{I} = \frac{ml}{ne^2A\tau}$ or $R = \frac{ml}{ne^2A\tau}$ (I)

Eqn (I) is the microscopic formula for the resistance of a wire.

2) Resistivity in term of electron density and relaxation time :—

Since $R = \frac{\rho l}{A}$ but here $R = \frac{ml}{ne^2A\tau}$

so $\frac{ml}{ne^2A\tau} = \frac{\rho l}{A}$ or $\rho = \frac{m}{ne^2\tau}$ (II)

Here m = mass of the electron, n = electron density, e = charge on the electron, τ = relaxation time.

so $\sigma = \frac{1}{\rho} = \frac{1}{\frac{m}{ne^2\tau}} = \frac{ne^2\tau}{m}$

or conductivity $\sigma = \frac{ne^2\tau}{m}$ (III)

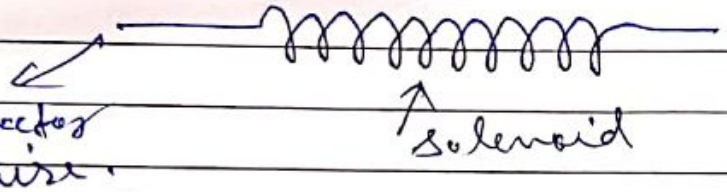
Cause of resistance. Collisions are the basic cause of resistance. When a potential difference is applied across a conductor, its free electrons get accelerated. On their way, they frequently collide with the positive metal ions *i.e.*, their motion is opposed and this opposition to the flow of electrons is called resistance. Larger the number of collisions per second, smaller is the relaxation time τ, and larger will be the resistivity ($\rho = m / ne^2 \tau$).

The number of collisions that the electrons make with the atoms/ions depends on the arrangement of atoms or ions in a conductor. So the *resistance depends on the nature of the material* (copper, silver, etc.) of the conductor.

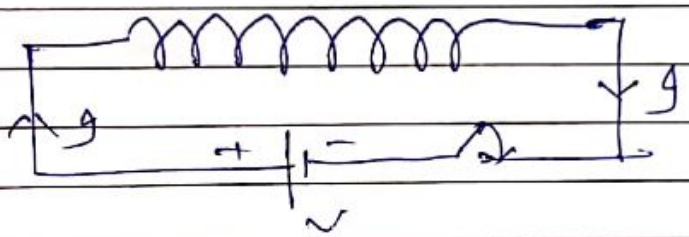
The resistance of a conductor depends on its length. A long wire offers more resistance than short wire because there will be more collisions in the longer wire.

The resistance of conductor depends on its area of cross-section. A thick wire offers less resistance than a thin wire because in a thick wire, more area of cross-section is available for the flow of electrons.

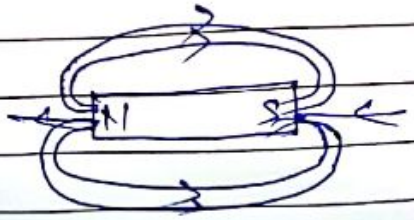
Solenoid :→ when a conductor wire is given the shape of a spring or helix then this is called a solenoid

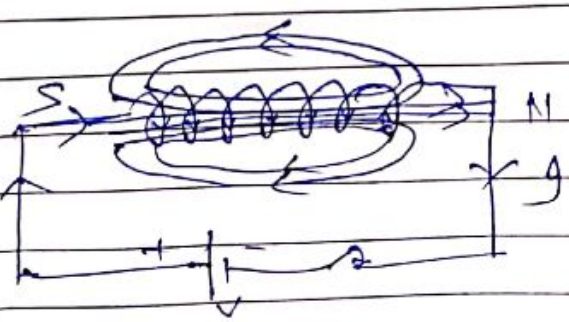


Here conductor wire is coated with some insulating material to ensure separation between the two consecutive turns.



when connected with a battery then current is passed and it becomes a magnet, we know that a current carrying wire or loop is a magnet. Here magnetic field produced by the solenoid is just like the magnetic field produced by a bar magnet





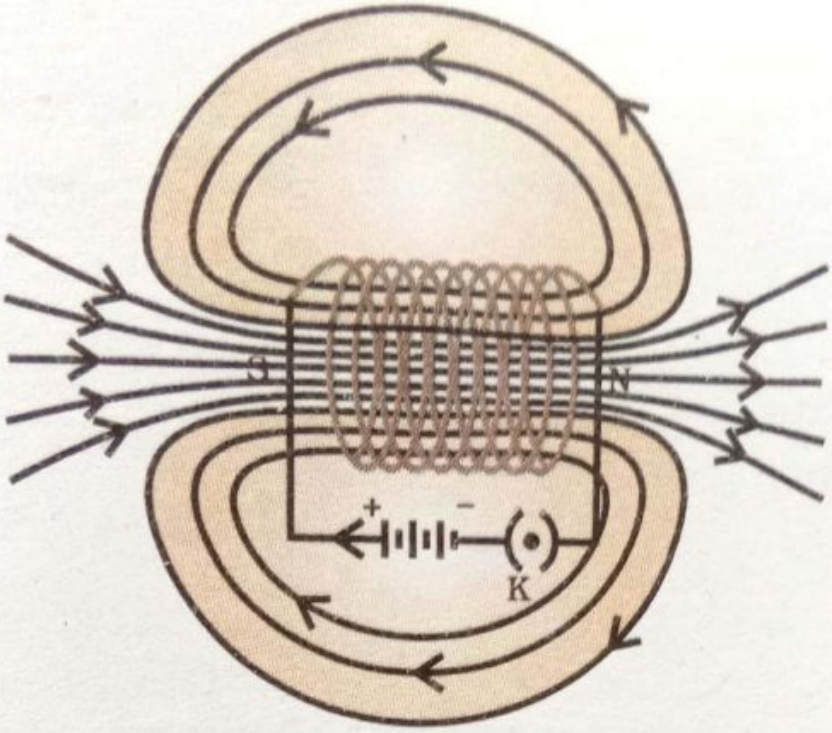


Figure 13.10
Field lines of the magnetic field through and around a current carrying solenoid.

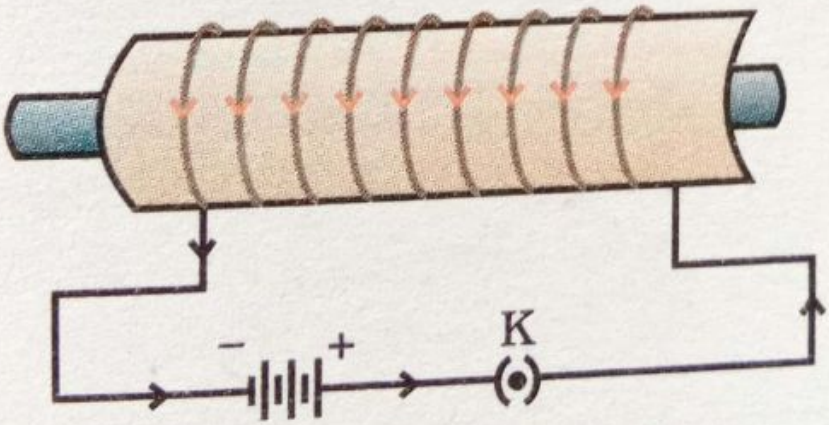


Figure 13.11
A current-carrying solenoid coil is used to magnetise steel rod inside it – an electromagnet.

ONLINE CLASS STUDY MATERIAL

CLASS : V

SUB : MATHS

LESSON : PRACTICE PAPER

DATE : 20/06/2020

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1. **Fill in the blanks** :

(A) The greatest number of 9- digit is _____.
(B) The smallest numbe of 8-digit is _____.
(C) The place value of the digit 7 in 10 07 30 200 _____.
(D) 80 80 80 808 comes just after _____.
(E) 5 36 48 999 comes just before_____.

2. **Answer the following**:

(A) Write 87 65 43 210 in expanded form.
(B) Write 6 54 32 123 in words.
(C) Write the numeral for Fifty crore,forty lakh,forty thousand,one hundred.
(D) Write the ROMAN NUMERALS from 30 to 50.
(E) Write in Ascending order:
87 7 87 877, 69 69 69 696,99 96 66 555,87 90 00 001

3. **Do these sum:**

(A) 780605 – 391236
(B) 1234567 + 8907865
(C) 7895432 – 1689654
(D) 7899876 – 5898999 + 3213213
(E) 456456 + 367890

ONLINE CLASS STUDY MATERIAL

CLASS : IV

SUB : MATHS

LESSON : PRACTICE PAPER

DATE : 20/06/2020

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1. **Fill in the blanks** :
   (A)The smallest number of 9-digits is _____.
   (B)The place value of 7 in 7 08 923 is _____.
   (C)The successor of 42999 is _____.
   (D) The predecessor of 87876 is _____.
   (E)The greatest five digit number using digits 9,0,1,2 and 3_____.
   (F) How many hundreds make a lakh ? _____.
2. **Write the numbers in words**:
   (A)34324 (B)421221 (C) 21010
   (D)111111 (F) 64749
3. **Answer the following**:
   (A) Write 38765 in expanded form.
   (B) Write five consecutive numbers starting from 12197.
   (C) Write the numeral for sixty thousand five hundred twenty.
   (D) Write the ROMAN NUMERALS from 1 to 30.
   (E) Write in Ascending order: 9546, 4321,867 ,99 and 12

Shatabdi Public School,Gaya

Session:- 2020-21

Subject:-English
English Grammar Book

Class-IV
Section-(A&B)
Date-20/6/2020

Degrees of Comparison

A.We use objectives not only to describe people or things but also to compare them.

B.some adjectives used to compare persons are things. They have three degrees of comparison: positive, comparative and superlative.

1.Positive degree……no comparison
Eg:-Lakshman is a strong man.
2.Comparative degree…...for two persons or things
Eg:-Aslam is stronger than Lakshman.
3.Superlative degree…...for more than two persons or things.
Eg:- Balaram is the strongest of the three.

Question no1
Learn page no 39 in English grammar book.
Question no 2
Write one page writing.

(Shagufta Khan)

Introduction to Quadratic Equations

Quadratic Polynomial

A polynomial of the form ax2+bx+c, where a,b and c are real numbers and a≠0 is called a quadratic polynomial.

Quadratic Equation

When we equate a quadratic polynomial to a constant, we get a quadratic equation.

Any equation of the form p(x)=c, where p(x) is a polynomial of degree 2 and c is a constant, is a quadratic equation.

The standard form of a Quadratic Equation

The standard form of a quadratic equation is ax2+bx+c=0, where a,b and c are real numbers and a≠0.
'a' is the coefficient of x2. It is called the quadratic coefficient. 'b' is the coefficient of x. It is called the linear coefficient. 'c' is the constant term.

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is ax2+bx+c=0, where a,b and c are real numbers and a≠0.
'a' is the coefficient of x2. It is called the quadratic coefficient. 'b' is the coefficient of x. It is called the linear coefficient. 'c' is the constant term.

Solving QE by Factorisation

Roots of a Quadratic equation

The values of x for which a quadratic equation is satisfied are called the roots of the quadratic equation.

If α is a root of the quadratic equation ax2+bx+c=0,then, aα2+bα+c=0.

A quadratic equation can have two distinct roots, two equal roots or real roots may not exist.

Graphically, the roots of a quadratic equation are the points where the graph of the quadratic polynomial cuts the x-axis.

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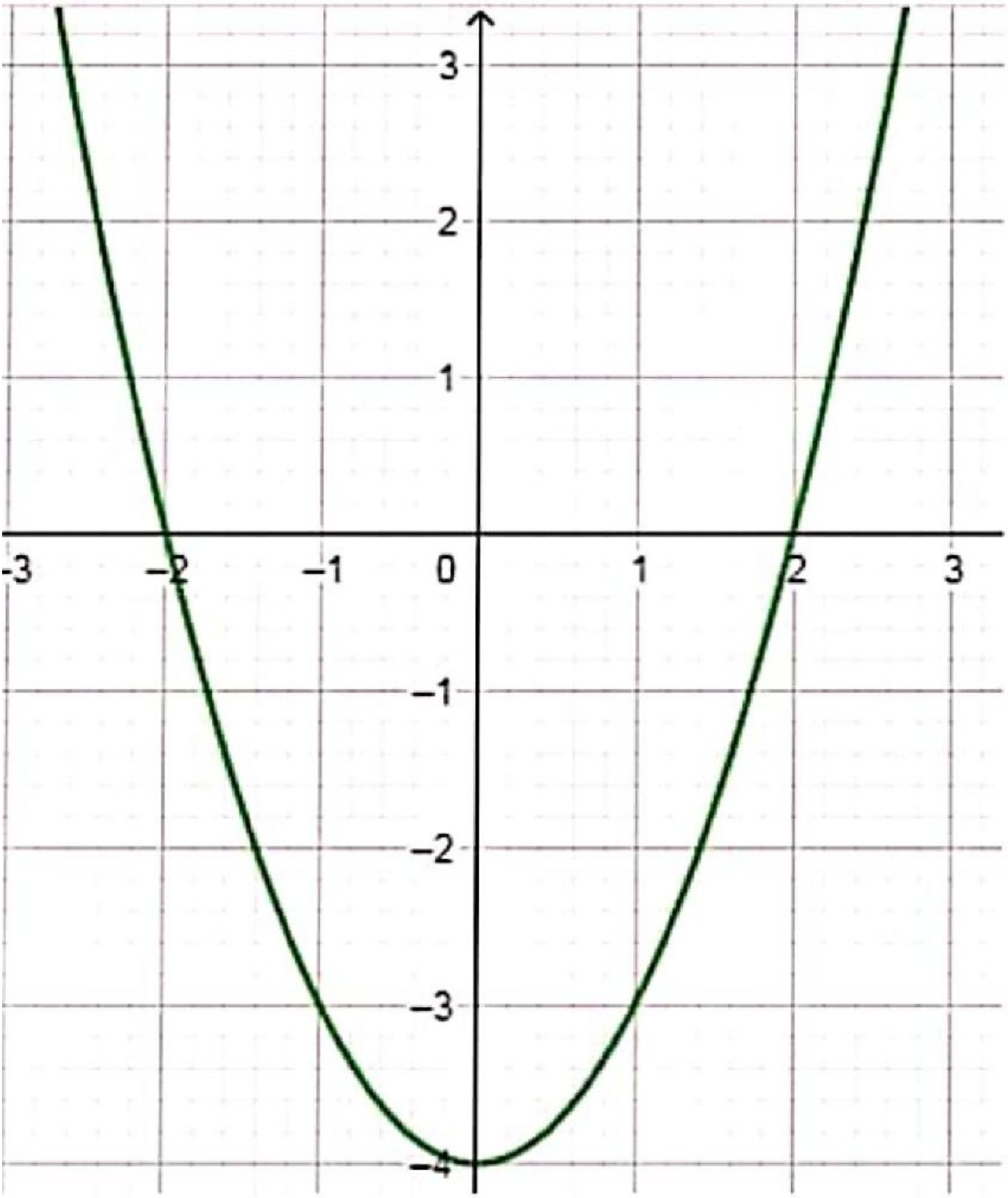

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Graph of a Quadratic Equation

In the above figure, -2 and 2 are the roots of the quadratic equation $x2-4=0$

Note:

If the graph of the quadratic polynomial cuts the x-axis at two distinct points, then it has real and distinct roots.

If the graph of the quadratic polynomial touches the x-axis, then it has real and equal roots.

If the graph of the quadratic polynomial does not cut or touch the x-axis then it does not have any real roots.

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CLASS: X A ; SUB: MATHEMATICS

DATE: 20/06/2020 Shakil Ahmad

Ex 13.4

CASE-I

$r = 7\text{cm}$

Vol^m of Sphere $= \frac{4}{3}\pi r^3$

$= \frac{4}{3} \times \frac{22}{7} \times 7 \times 7 \times 7 \text{ cm}^3$

$= \frac{4 \times 4 \times 22}{3} \text{ cm}^3$

CASE-II

$R = 14\text{cm}$

$\therefore$ Vol$^m = \frac{4}{3}\pi R^3$

$= \frac{4}{3} \times \frac{22}{7} \times 14 \times 14 \times 14$

$\therefore$ Reqd. Ratio $= \frac{\text{Vol}^m \text{ of sphere with radius } 7\text{cm}}{\text{Vol}^m \text{ of sphere with radius } 14\text{cm}}$

$= \frac{\frac{4}{3} \times \frac{22}{7} \times 7 \times 7 \times 7}{\frac{4}{3} \times \frac{22}{7} \times 14 \times 14 \times 14}$

$= \frac{1}{8} = 1:8$

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(7) Let the diameter of the ~~moon~~ Earth be D

The radius of the Earth $= \frac{D}{2}$

Thus radius of the moon $= \frac{\frac{D}{2}}{4} = \frac{D}{8}$

Reqd. ratio $=$ $\frac{\text{C.S.A of the Moon}}{\text{C.S.A of the Earth}}$

$= \frac{4\pi r_m^2}{4\pi R^2}$

$= \frac{\left(\frac{D}{8}\right)^2}{\left(\frac{D}{2}\right)^2} = \frac{\frac{D^2}{64}}{\frac{D^2}{4}}$

$= \frac{D^2}{64} \times \frac{4}{D^2} = \frac{1}{16}$

$= 1:16$

Teacher's Signature .....

Class - VIII D Subject - Physics Date - 20/6/2020

Ch - 13 : Sound

How do humans produce sound?

- Human beings have a voice box or larynx which is present in their throat on the upper side of the windpipe.
- The larynx has 2 vocal cords which have a narrow slit between them so that air can pass through it.
- As the lungs through air out of the windpipe, it passes through the slit and hence allows the production of sound as the vocal cords start vibrating.
- The vocal cords of males are larger (20 mm) than females (15 mm). That is why males have louder voice than females.
- children have very small voice box that is why they have most shrill voice.

H.W:- Draw the diagram of larynx here

How do we hear?

We hear with the help of our ears.

Human ear

Human ear has 3 main parts:

1. Outer ear (Pinna) → It catches the sound waves & forward them to the next part of the ear.
2. Middle ear → It converts the sound waves into vibrations that them travel to the inner ear.
   - Middle ear has a thin rubber-like sheet present in the middle ear called ear drum. As the sound waves reach the ear drum, it vibrates & then these vibrations propagate to the inner ear

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