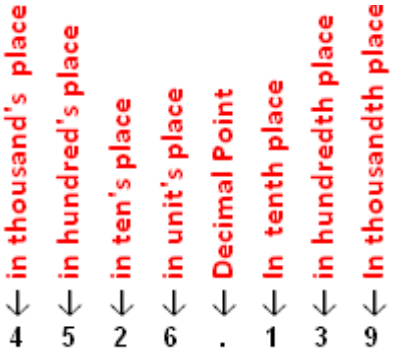
Decimals and Percentages

Types of Decimals

Definitions: **Decimals** are the numeric values of any type of real numbers. The values of any given fraction or an irrational is expressed in the decimal form.

0.111, 45.342, 9.000001, 2.000 are few examples of decimal numbers.
Consider the decimal number 45.342. Here 45 is said to be the **integer part** or **integral part** of the decimal number whereas 342 is said to be the **decimal part** of the number .

Now consider the number 4526.139.



Examples:

Let us consider few examples:

1) Now when we divide 1 by 4, then we get quotient as 0.25

2) When we divide 1 by 11 we get the quotient as 0.142857142857142857....

We observe that the decimals never terminate but 142857 keeps on **repeating periodically**.
Hence these type of decimals are known as **recurring decimals** or **repeating decimals**.

0.142857142857142857.... is represented as $0.\overline{142857}$ as 142857 keeps on repeating.

Whereas when we divide 25 by 18 the quotient will be 1.38888888888888.....

All the decimals are non-terminating. But only 8 is repeating periodically.
Hence 1.38888888... is represented as $1.3\overline{8}$.
Try to understand the difference between $1.\overline{38}$ and $1.3\overline{8}$
The value of $1.\overline{38}$ = 0.38383838..... whereas the value of $1.3\overline{8}$ = 0.3888888888 ….

3) Consider irrational number $\sqrt{2}$
The value of $\sqrt{2}$ = 1.41421 35623 73095 .....

Here, note that the decimals never terminate and there is no sequence that repeats periodically as it does in the recurring decimals.

Addition and Subtraction of Decimals

Example:
Let us see few examples on addition and subtraction of Decimals

1) 1.021 + 0.912

```
  1 . 0 2 1
+ 0 . 9 1 2
  1 . 9 3 3
```

2) 1.9928 + 3. 4521

```
  1 . 9 9 2 8
+ 3 . 4 5 2 1
  5 . 4 4 4 9
```

3) 0.2354 + 1.06 – 3.6524
= (0.2354 + 1.06) – 3.6524

```
  0 . 2 3 5 4
+ 1 . 0 6
  1 . 2 9 5 4
```

Hence we need the value of 1.2954 – 3.6524
Now 1.2954 – 3.6524 = - (3.6524 – 1.2954)

```
  3 . 6 5 2 4
– 1 . 2 9 5 4
  2 . 3 5 7 0
```

Hence 1.2954 – 3.6524 = - 2.357

4) -3.2409 – 2.142 + 54.32
= 54.32 – (3.2909 + 2.142)

```
  3 . 2 9 0 9
+ 2 . 1 4 2
  5 . 4 3 2 9
```

Now, we need to find the value of 54.32 – 5.4329

$$\begin{array}{rr} & 54.3200 \\ - & \underline{\ 5.4329} \\ & \mathbf{48.8871} \end{array}$$

The required value is 48.8871

Decimals and Fractions

Introduction: While multiplying or dividing the decimals we have to be very careful about the decimals places of the given number. Generally students make mistakes in the decimal places.

In order to avoid mistakes, the best method will be first convert the given decimals into fractions and then divide or multiply the fractions accordingly.

Let us see how to convert the given decimals into fractions.

Examples: **To convert decimal into fraction, multiply & divide the decimal by 10 or 100 or 1000 ... depending on the number of digits after the decimal points.**

For example: 0.125 = 0.125 x 1000 / 1000 ***(As there are 3 digits after the decimal points we multiply and divide 1000.)***
= 125 / 1000
= 1 / 8

10.75 = 10.75 x 100/100
= 1075 / 100
= 43 / 4

Now let us see how to convert the given fractions into decimals.

In a given fraction when a numerator is divided by a denominator till the remainder becomes zero, the quotient which is obtained are decimals.

For example :
1) Suppose we have to convert 5 / 4 into decimal,
just divide 5 by 4
so fraction 5/4 = 1.25 (in the decimal form)

2) Similarly 1/3 = 0.333333...(recurring decimal)

Division and Multiplication of Decimals

Examples: **Let us see few examples on Multiplication and Division of Decimals**

1) $0.52 \times 1.6 = \frac{52}{100} \times \frac{16}{10}$

$= \frac{832}{1000} = 0.832$

2) $\frac{0.75}{0.105} = \frac{75}{100} / \frac{105}{1000}$

$= \frac{75}{100} \times \frac{1000}{105} = \frac{75000}{10500}$

$= \frac{50}{7}$ ***(To find the value it will better if we covert the fraction into irreducible fraction.)***

$= 7.1428$ ***(In GRE , the value should be accurate up to 4 decimal places)***

3) $\frac{14 \times 0.15}{0.21} = 14 \times \frac{15}{100} \times \frac{100}{21}$

$= \frac{14 \times 15 \times 100}{100 \times 21}$ ***(When we see a common multiple in the numerator and denominator we can cancel the common multiple from the numerator as well as the denominator)***

$= \frac{14 \times 15}{21} = 10$

Quiz Time:

1) If the value of the fraction $\frac{p}{q}$ is an recurring decimal, then what type of decimal is obtained when q is divided by p.

- Recurring Decimal
- Non-Recurring Decimal
- Can't say

2) Which of the following choices gives the decimal values of $\frac{3}{12}$, $\frac{5}{7}$, $\frac{27}{36}$.

- $0.25,\ \overline{0.714285}\ , 0.75$
- $\overline{0.25},\ \overline{0.714285}\ ,\ \overline{0.75}$
- $\overline{0.25}\ , 0.714285, 0.75$
- $0.25,\ 0.714285,\ 0.75$

3) Which of the following is choice value is not equal to the value of $0.45+(\frac{0.6}{2})-(0.8\times0.5)$.

- $\frac{7}{20}$
- $0.45+(\frac{0.06}{0.2})-(0.8\times\frac{1}{2})$
- $\frac{45}{100}+(\frac{0.06}{0.3})-(0.8\times0.5)$
- $1-\frac{13}{20}$

Absolute value of a number

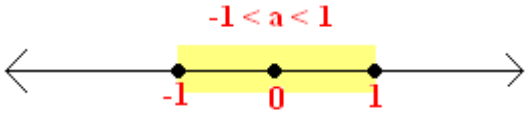
Definition: **The absolute value** (or **modulus**) of a real number is its numerical value irrespective to its sign. So, for example, 3 is the absolute value of both 3 and −3.
The absolute value of a number a is denoted by | a | .

Properties: **Let us consider the following property.**

1) $|0| = 0$.

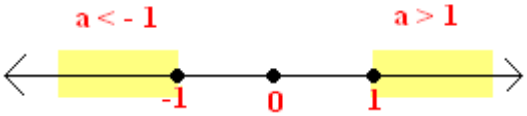
2) For any real number a such that $a \neq 0$, $0 < |a|$
That is absolute value of any non zero number is always positive.

3) Suppose it is given that **$|a| < 1$** (or any positive number), then **$-1 < a < 1$**



That is the value of a lies in between -1 and 1.

4) Suppose it is given that **$|a| > 1$** (or any positive number), then either **$a > 1$ or $a < -1$**



That is the value of a is either greater than 1 or less than -1.

Square of a number

Definition: **Square** of a given number is obtained by multiplying that number with itself. Suppose N is any number, then the square of the number N will be $N \times N = N^2$

For example 1) 4 is a square of 2 and 4 is also the square of -2.
2) $\frac{1}{4}$ is a square of $\frac{1}{2}$ and also the square of $-\frac{1}{2}$
3) 0.09 is the square of 0.3 and and also the square of -0.3
4) 1 is the square of 1 and also the square -1

Properties: **Let us consider the following property.**
1) We say that a square number is said to be **perfect square**, if the number is an integer that can be written as the square of some other integer.
For example, 1,4, 9,16,..... are the perfect squares.

2) $0 \times 0 = 0^2 = 0$

3) Square of any zero real number is always positive.

4) If 0<N<1 then,
$N^2 < 1$
Hence $0 < N^2 < N < 1$

For example, if N = 0.9 (< 1) then,
$N^2 = 0.9 \times 0.9 = 0.81$

We get $0 < 0.81 < 0.9 < 1$

that is $0 < 0.9^2 < 0.9 < 1$

5) If N= 1 or N= -1 then,
$1^2 = (-1)^2 = 1$

6) If N > 1 then
$N < N^2$
Hence $1 < N < N^2$

For example, if N = 1.1(> 1) then,
$N^2 = 1.1 \times 1.1 = 1.21$

We get 1 < 1.1 < 1.21

that is $1 < 1.1 < 1.1^2$

Square root of a number:

Definition: Let N be a positive number. **Square root** of N is a number say R, such that $R \times R = R^2 = N$. Every positive real number has a positive square root and a negative square root. Positive square root of N is denoted by $\sqrt{N}$.

Hence we say $\sqrt{N}$ and $-\sqrt{N}$ are two square roots of N.

For example 1) 2 and -2 are the square roots of 4.
2) $\frac{1}{2}$ and $-\frac{1}{2}$ are the square roots of $\frac{1}{4}$

3) 0.3 and - 0.3 are the square roots of 0.09

Properties: **Properties of a Square Root of a Number.**

These Properties are very important as these can be used in Data Comparison type of question.

Let N be any positive real number.
1) sqrt 0 = 0

2) If 0 < N < 1 then,
$N < \sqrt{N}$ and $\sqrt{N} < 1$
Hence $0 < N < \sqrt{N} < 1$

For example, if N = 0.5 (<1) then,
The value $\sqrt{N}$ = 0.7071(approx)
We get 0 < 0.5 < 0.7071< 1

That is $0 < 0.5 < \sqrt{0.5} < 1$

3) If N =1
then $\sqrt{1} = 1$

4) If N > 1 then
$\sqrt{N} < N$ and $1 < \sqrt{N}$
Hence $1 < \sqrt{N} < N$

For example, if N = 1.69 (>1) then,
The value $\sqrt{N}$ = 1.3
We get 1 < 1.3 < 1.69

That is $1 < 1.3 < 1.3^2$

Additional Properties:
Note that: Square root of a negative number gives an **imaginary number**. Basically $\sqrt{-1}$ is an imaginary number. ***(Imaginary numbers is out of GRE syllabus.)***

Square and Square Root Properties.

Introduction: Let N be any number. Relation between N and N^2 behaves differently in the different range of N. Similarly the relation between N and $\sqrt{N}$ behaves differently in the different range of N.

Properties:

Let us consider the different range as the different case. (provide examples)

Case 1:

If N = 0 then,

$N^2 = 0$ and $\sqrt{N} = 0$.

Case 2:

If N = 1 then

$N^2 = 1$ and $\sqrt{N} = 1$

Case 3:

If N = -1 then

$N^2 = 1$ but $\sqrt{N} = \sqrt{-1}$ (imaginary number.)

Case 4:

If $0 < N < 1$ then,

$N < \sqrt{N}$ and $N^2 < N$.

Hence, $N^2 < N < \sqrt{N}$

For example, if N = 0.09 (< 1) then,

$\sqrt{N} = 0.3$ and $N^2 = 0.0081$

We see that $0 < 0.0081 < 0.09 < 0.3 < 1$

That is $0 < \sqrt{0.09} < 0.09 < 0.09^2 < 1$

Case 5:

If $1 < N$ then,

$\sqrt{N} < N$ and $N < N^2$.

Hence, $1 < \sqrt{N} < N < N^2$

For example, if N = 9 (> 1) then,

$\sqrt{N} = 3$ and $N^2 = 81$

We see that $1 < 3 < 9 < 81$

That is $1 < \sqrt{9} < 9 < 9^2$

Quiz Time:

1) If N is the perfect square number, then the condition $\sqrt{N}$ > N² holds.

- True
- False
- Can't Say

2) Let -1 < N < 0, compare the following columns.

Column A: $N^2 - N$

Column B : $N^2 + N$

3) Let N = -10, Compare the following columns.

Column A: $\left| \{|N - 3| - |N + 2|\} \right|$

Column B: $|(N-3) - \{N + 2\}|$

4) If N² < N, then what could be the possible value of $\sqrt{N}$.

- 1
- 0.25
- -0.36
- 0

Percentages

Introduction: **Consider the following situation.**

Sam has scored 35 out of 40 and Jack has scored 45 out of 60.
How do we say whose score is better?

In this situation we make use of the Percentages.

First let us understand what is meant by percentages:

Definition: The word **cent** means 100, hence **percent** means "out of 100" or "by 100". **Percentages** are correctly used to express fractions of the total in term of 100.
Usually percentages are expressed along with "%" sign.

Let us find 25% of 60.

25% of 60

$= \frac{25}{100} \times 60 = 15$

Similarly 150% of 90

$= \frac{150}{100} \times 90 = 135$

Properties: Suppose 'x' and 'y' are some positive numbers,
then $x\% \times y = y\% \times x$.

For example: 25% of 175 $= \frac{25}{100} \times 175 = \frac{1}{4} \times 175 = 43.75$

and 175 % of 25 $= \frac{175}{100} \times 25 = \frac{7}{4} \times 25 = 43.75$

Hence 25% of 175 = 175 % of 25

Example: **How do we calculate the percentages?**

Now in the above example Sam's score is 35 out of 50.
Here percentage can be calculated as $\frac{35}{50} \times 100 = 70\%$.

Whereas the Jack's score as a percentage is given be $\frac{45}{60} \times 100 = 75\%$

Hence here we see Jack scored better than Sam.

Let us consider another example.

Suppose Maria's salary is $5000 per month and she donated 25% of her salary to an organization. What is the amount that she donated?

Here the donated amount is given by 25% of $5000.

25% of 5000 = $\frac{25}{100} \times 5000$

= 1250

Hence the donated amount = $1250.

Percentage Increase and Percentage Decrease: (important)

Introduction: **Consider the following examples.**

Suppose Frank has 10 pens and Joe has two more pens than Frank . Then how many pens does Joe have?

Just understand the statement clearly:."Joe has two more pens than Frank"
This means Joe has as many pens as Frank has and he has two more.

Joe had 10 + 2 = 12 pens.

Similarly, if Frank has 15 pens and Joe has 5 pens less than Frank, then how many pens does Joe have?

Here it is given that " Joe has five pens less than Frank ".
This means Joe has 15 – 5 = 10 pens.

In these examples, we calculated increase and decrease with respect to the quantity.
We can also find increase and decrease with respect to the percentage. Let us see how.

Procedure : **When a Question says:**

By what percentage is A greater than B ?

You must find : $\frac{(A-B)}{B} \times 100$

Whereas when a Question says:

By what percentage is A lesser than B ?

You must find : $\frac{(A-B)}{B} \times 100$

Note that: In both the cases the difference between A and B is being compared with B. This means B

is the **reference value**. So in the denominator, we have B. In the numerator, we have the difference between A and B, that is |A – B| .

Similarly, if A is the reference value, then A goes in the denominator. In the numerator, we have the difference between A and B, that is |A – B| when the difference between A and B is being compared.

The question statement in this case will be :
By what percentage is B greater than A?
OR
By what percentage is B lesser than A?

You must note the difference in wordings.

Ask yourself : Who is being compared with whom ?

Here are few examples of statements of these type of Questions:

- By what percentage is Bob's income greater than Jane's?
- By what percentage is train A faster than train B?
- In university A, by what percentage did the enrollment of female students in 1978 increase over the previous year ?

The solution for these type of questions boils down to (B – A) / A x 100 %. The only thing here is to identify correctly what A is.

Example: **Now consider the following examples:**

1) Sandy scored totally 500 in an exam. Suppose Sandy gets an additional 50 marks for her work in co-curricular activities, by what percentage does her score increase? Or by what percentage is Sandy's final score is greater than her initial score.

Now how to answer this question?

$$\text{Percentage increase} = \frac{Final\ Score - Initial\ Score}{Initial\ Score} \times 100$$

Sandy's final score = 500 + 50 = 550
and her initial score = 500

Hence, Percentage increase $= \frac{550-500}{500} \times 100$ **= 10 %**

2) By what percentage is 60% greater than 50%?

Now the difference between 60% and 50% is 10%.
But the question is "by what percentage?".
So it can be calculated as (60 – 50) / 50 x 100 = 20 %.
So the 60% is greater than 50% by 20%.

3) Suppose Frank has 80 stamps and Joe has 100 stamps. By what percentage does Frank have lesser number of stamps as compared to Joe?

Here, percentage decrease $= \dfrac{Number\ of\ stamps\ Joe\ has - Number\ of\ stamps\ Frank\ has}{Number\ of\ stamps\ Joe\ has} \times 100$

Hence, Percentage decrease $= \dfrac{100-80}{100} \times 100$ **$= 20\ \%$**

Quiz Time:

1) What is 50% of 2500?

2) Find the percentage of Jack score, if he scored 510 out of 750.

3) Compare the following columns.
Column A : 49 % of 60
Column B: 60% of 49

4) A worker gets his wages on a daily bases. If he could not come for the work for 5 days in the month of September, by what percentage does his monthly salary get reduced if his wage per day is $25.

5) Sam's monthly salary is $1500 and John's salary is 75% of Sam's salary. Find by what percentage is Sam's income is more than John's ?

Fractions and Percentages:

Introduction: We know that fraction is a part of the whole. Percentages is also fraction of the total, but in terms of 100.

Both fractions and percentages denotes a part of the total number. Hence we can express the fractions in terms of percentages and percentages in terms of fractions.

Let us see how.

Procedure: Converting Fractions into Percentages

To convert fractions into percentage, just multiply the fraction by 100.
For example:
1) fraction ¼ = ¼ x 100 % = 25%

2) fraction 1/10 = 1/10 x 100% = 10%

Hence ¼ th of N **is equivalent to** 25% of N and 1/10 th of N **is equivalent to** 10% of N.

Procedure: Converting Percentages into Fractions

To convert percentage into fraction, divide the number by 100
For Example:
1) 25% = 25 / 100
= 1 / 4

2) 1% = 1 / 100

Decimals and Percentages:

Introduction: We have already seen how to convert fractions into decimals and decimals into fractions. Let us also learn how to convert decimals into percentages and percentage into decimals.

Procedure: **How to convert Decimals to Percentages (change properties to procedure where applicable)**

To convert decimal into percentage, multiply the decimal by 100
For example: 0.125 = 0.125 x 100 %
= 12.5%

0.0003 = 0.0003 x 100 %
0.03 %

Procedure: **How to convert Percentages to Decimals**

To convert percentage into decimal, divide the number by 100 and continue with the division
For Example: 25% = 25 / 100

= 1 / 4 (fraction)
= 0.25 (decimal)

1% = 1 / 100 (fraction)
= 0.01 (decimal)

Examples on Fractions, Decimals and Percentages

The following table shows the numbers in three equivalent forms. It will be good if you use the conversion techniques demonstrated above and verify the equivalence yourself.

	decimal	Fraction	percentage
Half	0.5	1 / 2	50%
One third	0.33333...	1 / 3	33.333...%
One fourth or quarter	0.25	1 / 4	25%
Three fourth	0.75	3 / 4	75%
	0.32	32 / 100 = 8 / 25	32%
	0.001	0.1 / 100 = 0.001	0.1%
	0.9	9 / 10	90%
	1.05	105 / 100 = 21 / 20	105%
	1.33	133 / 100	133%

Let us consider few examples which involves the conversions.

1) By what percentage 0.25 is less than 2 / 5?

Ans: 2/5 is a fraction whereas 0.25 is a decimal. So either convert 2 / 5 into decimal or 0.25 into fraction. Let us adopt one way.
2 / 5 = 0.4 (decimal)
Now you can proceed with formula, [state the formula and explain who goes in the D]
{(0.4 – 0.25) / 0.4} x 100 %
= {0.15 / 0.4} x 100 %
= {3 / 8} x 100 %
= 37.5 %

So, 0.25 is 37.5% smaller than 2 / 5.

2) Let Y = 100. If I add three fifth of 125 to Y and further add 75% less than 100. What do I obtain?

Ans: Three fifth of 125 will be 3/5 X 125 = 75.

add 75 to Y then new number = (100 + 75) = 175.

Let us now calculate the value of the number which is (75% less than 100):

It will be

= 100 - 75% of 100

= 100 - 0.75 X 100

= 100 - 75

= 25

Hence further if I add (75% less than 100) to the new number then I obtain (175 + 25) = 200

3) Let Y = 100. If I add two fifth of 125 to Y and further add 50% of 100 , by what percentage the new number is greater than Y?

Ans: The new number will be 200**(Please solve yourself and verify)**

Now, we have to find the percentage by which the new number is greater than Y.

Applying the formula we get

{(200 - 100)/100} X 100%

= 100%

Hence 200 is 100% more than 100.

4) Suppose train A travels from station X to station Y at the speed of 30 m/s and train B travels the same distance at 72 Km/hr. Which train takes lesser time to reach station Y ? By what percentage will that train be faster than the other one?

Ans: Convert the speed of the train B in m/s,

72 km/hr = (72 x 1000)/ (60 x 60) = 20 m/s

This means that train B is slower than train A.

Hence Train A will take lesser time compared to Train B to reach station Y.

Now we can the calculate the percentage by which train A is faster than train B.

Your answer should be (Ans: 50 %)

Quiz Test

1) Find the value for the following:

a) What is the 25 % of 50?

b) What is one fifth of 25% of 75?

2) Compare the following:

Column A: $\frac{1}{4}$ **of 760**

Column B : 25% of 760

3) Compare the following:

Column A: $\frac{1}{8}$ **of 45% of 760**

Column B : 25% of 760

4) Lorrie use to save 40 % of his salary every month. He invested two fifth of his savings in shares. If the amount that he invests in shares is $200 per month, what is the Lorrie's monthly salary.

Solved Question:

1) Suppose 1< p < q
Column A: |q - p|
Column B: | q - 2p|

Solution:

We can compare the column by putting the value .
For example if p = 5 and q = 6 then,
Column A : |q – p| = | 6 – 5| = 1
Column B : |q – 2p| = |6 – 10| = 4
Here Column A < Column B

Take another assume values like q = 7 , p = 2
Column A : |q – p| = |7 – 2| = 5
Column B : |q – 2p| = | 7 – 4| = 3

Here Column A > Column B

So we can conclude that we can't find which column is greater .

2) Let p and q be two integers such that 4 < p < 8 and -10 < q < -7
Column A: min | p - q|
Column B: 0
Solution:

Given: 5<p<8 , -6>q > -10
So p = { 6,7,8} and q = { -9,-8,-7}
Here the possible value of the | p – q| = { 15,14,13,16,17} when we will take the different combination of the p , and q .
So the Column A : min | p – q| = 13.

Similarly (q – p) = { -15,-16,-17,-14,-13}
So the max(q – p) = -13
So the Column B : | max (q – p) | = 13

From the above Column A is equal to Column B .

3) Mary gets a pocket money of $10 per week from her father. Out of which, she saves some amount per week. After 5 weeks, she saved $35. Find the percentage of the amount of money she has saved in these 5 weeks.

Solution:

Given : Mary gets pocket money = $ 10 per week
Money saved by Mary in after 5 week = $ 35

The total money received by the Mary After 5 weeks = 10 X 5 = $ 50

So the % of amount saved by Mary = $\frac{35}{50}$ X 100 = 70 %

So the answer is 70%.

4) Maria says that her salary is 200% of her brother's salary. Suppose Maria's brother got a promotion and his salary is increased by 45%. Compare the given columns
Column A : Brother's salary after promotion
Column B : $\frac{2}{3}$ **rd of Maria's salary.**

Solution:

Lets consider the Maria's Brother salary is P
So the Maria salary is given by = 200% of P
= 2 P
Maria' Brother salary after promotion
= P + 45% of P
= P(1 + $\frac{45}{100}$)
= 1.45 P
So column A: 1. 45 P
Column B: $\frac{2}{3}$ of Maria's salary
= $\frac{2}{3}$ of 2P

= $\frac{4P}{3}$ = 1.33 P
So Column B = 1.33 P
From the above Column A is greater than Column B .

5) 20ml of acid solution of 25% concentration is mixed with 15ml of acid solution of 50% concentration. Find the percentage of the concentration of acid in the new solution.

Solution:

The amount of acid in 20 ml acid solution = 25% of 20 $= \frac{25}{100} \times 20$

$= 5$ ml

The amount of the Acid in 15 ml solution $= 50\%$ of 15 $= \frac{50}{100} \times 15$

$= 7.5$ ml

Total amount of acid in the new solution = 5 + 7.5 = 12. 5ml
Total amount of new solution = 20 + 15 = 35 ml

So the % of concentration of acid = $\frac{12.5}{35} \times 100 = 35.7\%$

So the answer is 35.7%

Review Test(Easy).

1) Suppose – 1< p < 1 and p ≠0
Column A: $1/p^2-1$
Column B: 0

2) Let $N^2=\sqrt{0.016/0.00001}$ **. What is the value of** $\sqrt{N}$

3) Tom invested $7000 in stocks of company A. After a year, the value of the stocks of company A increased by 50%. Tom sold off all the stocks and reinvested only his profit in stocks of company B. After an year, the value of the stock of company B fell by 30%. At the end of two year, what was Bob's profit amount ?

4) Shelley is working on a project. For that she planned that she will spend half an hour daily for 8 days and will finish 2/3 rd the project . But instead of that, she actually spent 45 minutes everyday for 8 days. How much amount of her project work has she completed at the end of 8 days ? (Hint : Find the time required to complete the whole project.)

5) Julie makes 1 liter of sugar syrup by mixing sugar and water. Concentration of the syrup is 40%. When Julie tastes the syrup she finds the syrup too sweet. Hence she adds another 250 ml of water to the syrup. Now find the concentration of new syrup solution.

6) There are three jugs. The volumes of Jug A, Jug B and Jug C are 250ml, 500 ml and 1 litre receptively. ¾ th of Jug A and 2/5 rd of Jug B are filled with water. Now the water from the Jug A and Jug B is poured in Jug C. Find the additional amount of water need to be poured in JUG C so that Jug C is 6/10th full.

7) Anna wants to buy a gift for her friend. Anna purchases a dress worth $120 and a hat worth $60. The dress carries a 30% discount and the hat carries a 15% discount. If Anna makes the payment by cash, then she gets an additional 5% discount over the bill amount. How much does Anna pays if she makes the payment by cash.