

**786**



# **USMAN LAW ACADEMY**

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**YT:Usman Tips Points**

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# MATHS

① Percentage

2. Fraction

3. Algebra

4. Ratio and Proportion

5. Average

6. Basic Rules

7. Business

Fund  
class &  
questions

15% of 400 \_\_\_\_\_

a) of Total - of - - -

## BODMAS

$$\textcircled{1} \quad 7 - (9 - 3) + 11 = ?$$

$$\begin{aligned}
 &= 7 - (6) + 11 \\
 &= 7 - 6 + 11 \\
 &= 18 - 6 \\
 &\boxed{= 12}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{2} \quad (4^2 - 5 \times 2)^2 &= ? \\
 &= (16 - 10)^2 \\
 &= (6)^2 \\
 &\boxed{= 36}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{3} \quad (4 \div 2 \times 4) - 7 &= ? \\
 4 - (x - 5)(x - 7) &\cancel{\downarrow} = ? \\
 5 - 10 + (33 - 43) + 7 &= ? \\
 5 - (8 - 9)(n - 11) &= ?
 \end{aligned}$$

## Decimal

## Numbers System

~~System~~

The decimal number system is the standard for denoting integers and non-integers numbers.

~~188~~

0, 1, 2, 3, 4, 5, 6, 7, 8, 9 → Digits  
Decimals | ← Number  
Numbers | ← Some  
 $(321.1)_{10}$

## Terminology

~~Point=0333333333~~

321.1<sub>10</sub>  
Suffix  
Subscript  
base → (321.1)<sub>10</sub>  
Codix

Base 2 → Binary  
Base 10 → decimals  
Base 8 → octal

$$\begin{aligned}
 & \text{value} \\
 & (321.1)_{10} \\
 & = 300 + 20 + 1 + 0.1 \\
 & = 3 \times 10^2 + 2 \times 10^1 + 1 \times 10^0 + (10^{-1}) \\
 & = 3 \times 100 + 2 \times 10 + 1 + 0.1 \\
 & = 300 + 20 + 1 + 0.1
 \end{aligned}$$

## Odd numbers

A number which divide on 3 is called odd.

[1, 3, 5, 7, 9 - : - - -]

## Even and odd numbers

**even numbers** → A numbers which is divisible to 2 with no remainder.

For example 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, - - -

even numbers →  $0, \frac{2}{2}, \frac{4}{2}, \frac{6}{2}, \frac{8}{2}, \frac{10}{2}$  - - -

1 3 5 8 → → →  
4 7 8 9 → → →  
9 6 7 3 → → →  
1 2 5 4 → → →

## Natural numbers

- ① start from 1
  - ② no end
- $$\{ 1, 2, 3, \dots \}$$

## whole number

$$\{ 0, 1, 2, 3, \dots \}$$

All natural numbers including zero are whole numbers

All natural numbers are whole numbers (yes)

All whole numbers are natural numbers (no)

## Integers

- Integers are whole numbers that can form positive negative or zero.

not fraction

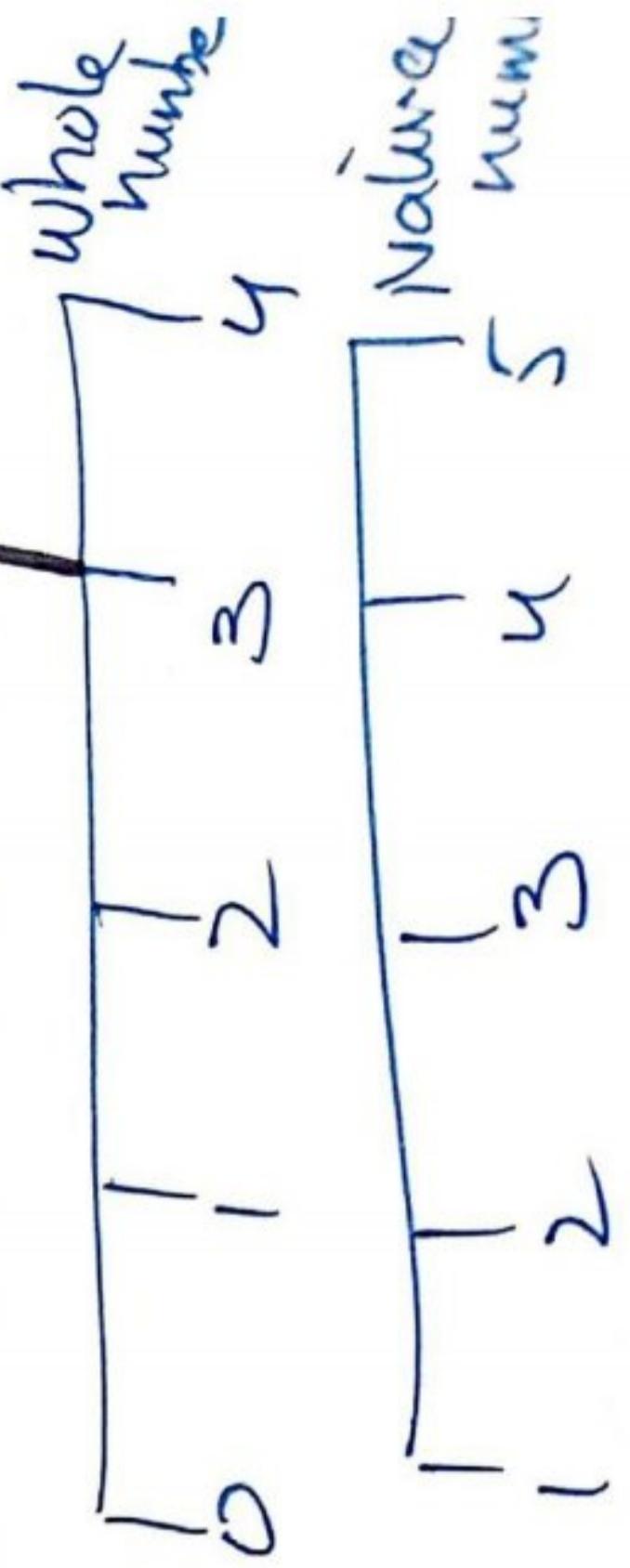
## Integers include

- ① counting number
  - ② integers
- $$\{ 1, 2, 3, \dots \}$$

- ① counting number
  - ② negative
- $$\{ -1, -2, -3, \dots \}$$

- ③ positive 0, zero

## Number Line Representation



~~Factors prime~~

ii) In what ~~is~~ numbers are divisible by numbers are divisible by itself and 1

~~number~~ which number is even  
iii) which number is odd

$$\boxed{21}$$

~~in integers~~  
 $\begin{array}{r} 7 \\ - 3 \end{array} \quad \begin{array}{r} 1 \\ - 2 \end{array} \quad \begin{array}{r} 1 \\ - 1 \end{array} \quad \begin{array}{r} 1 \\ - 2 \end{array} \quad \begin{array}{r} 3 \\ - 3 \end{array} \quad \begin{array}{r} 4 \\ - 4 \end{array} \quad \dots$

Prime number  $\rightarrow$  Divisible itself

[Factors]  $\rightarrow$  ① Itself divisible  
② by one

2, 5, 7, 11, ...

2 even, Prime

Mos's

prime numbers are greater than natural numbers than 1

Percentage

A Percentage is a number of parts expressed as a fraction of 100 per cent

$$\frac{800}{1000}$$

$$\frac{1}{100}$$

$$\frac{800}{1000} \times 100 \\ 80\%$$

- \* 25% of 3000
- \* 90% of 7000

~~Smart~~

$$* 20\% of 40 \\ = \frac{20}{100} \times 40 \\ = 8\%$$

$$* 5\% of 40 \\ = \frac{1}{20} \times 40 \\ = 0.08 \\ = \underline{\underline{0.08}}$$

1000  
50% of 1000

$$\frac{\text{Business Profit Loss}}{(\text{Profit} - \text{Loss})} \times 100 \\ (\text{Percentage})$$

Profit

$$S.P = C.P \times \frac{100 + Profit}{100}$$

$$C.P = \frac{Loss \times S.P}{100 + Profit}$$

Loss

$$S.P = C.P \times \frac{(100 - Loss)}{100}$$

$$C.P = \frac{Loss \times S.P}{100 - Loss}$$

15% of 400 —

15% of 400 =  
15 points  
15% of 400 = 60

60

ii - There are 60 students in the class, if 30% are boys, then how many girls are there in the class

$$70\% \text{ of } 60 = \frac{70}{100} \times 60 = 42$$

iii - A person bought a house for Rs 50,00,000. After two years he sold the house at the profit of 5%, How much profit he made

$$\frac{5}{100} \times 50,00,000 = 250,000$$

4 -  $\frac{x}{3} + \frac{5x}{3} + \frac{12x}{4} = 0$

- (a)  $1/6$  (b)  $1/3$   
 (c)  $1/4$  (d)  $2/7$

5 -  $(x+y)(2x+2y) =$

$$\frac{2x^2 + 2xy + 2xy + 2y^2}{2x^2 + 4xy + 2y^2}$$

6 - what percent is 3% of 20?

$$\frac{3}{100} \times 20 = 0.8$$

7 - what was Yousaf's income year if he paid an income tax of Rs 18,350 which is 40% of his incom

$$= \frac{45}{100} \times 18350 \\ = 45,875$$

8 - The assets of businessman increased from Rs 1,20,000 to Rs 5,80,000. what was the rate of change?

$$\text{Original } q_1 = 1,20,000 \\ \text{New } q_2 = 5,80,000 \\ \text{Amount Rate of change} = \frac{580,000 - 120,000}{120,000} \\ = 460,000$$

Rate

$$= \frac{\text{Amount of change}}{\text{original }} \\ = \frac{460,000}{120,000} \times 100$$

$$= \frac{383,333}{120,000} \times 100 \\ = 33\%$$

9. What number is 20% more than 9,000?

let  $x$  = new  $q$

original = 9000

increase = 20% =  $\frac{20}{100} \times 9000$

original + increase = Now  
 $q_{\text{new}}$

$9000 + \frac{20}{100} \times 9000 = x$

$$\frac{9000 + 1800 = x}{10800 = x}$$

10 - what number is 60% less than 900?

less than 900?

Let  $\rightarrow$  new quantity =  $x$

original = 2000

$$= \frac{4000 - 1200}{12000} \times 100 \\ = 33\%$$

$$\text{decrease} = 60\% \text{ of } 50\%$$

$$\begin{aligned}\text{New price} &= \text{original price} - \text{decrease} \\ &= 100 - \frac{60}{100} \times 50 \\ &= 100 - 30 \\ &= 70\end{aligned}$$

~~Q3~~ 2I - After a discount of 25%.  
The sale price of a suitcase  
is Rs 846. What was the  
original price of the suitcase?

$$\begin{aligned}\text{Let original price} &= x \\ \text{discount} &= \frac{25}{100} \times x \\ &= 0.25x \\ \text{New price} &= x - 0.25x \\ &= 0.75x \\ &= 846 \\ &= x \\ &= 1128\end{aligned}$$

~~Q3~~

$$x = \frac{846}{0.75} = 1128$$

~~Q3~~ 2II - In a 80 gallon mixture  
of milk and water, there is  
5% water. How much will not  
be added to make it 10%  
of the final mixture?  
95% of 20 gallons

$$\begin{aligned}&\frac{95}{100} \times 20 \\ &= 19\end{aligned}$$

19 is 90% of the final  
mixture

$$\begin{aligned}19 &= \frac{90}{100} \\ 19 &= 0.9x \\ 19 &= \frac{9}{10}x\end{aligned}$$

13 - How many pounds of Rs. 25 a lb. coffee have to be mixed with Rs. 10 lb. coffee to make a mixture of 60 pounds worth Rs 35 a pound?

$$60 \times 35 = \text{Rs } 2100$$

$$60 \times 25 = 1500$$

$$2100 - 1500 = 600$$

The difference in two grades

$$= 40 - 25$$

$$= 15$$

$$600 / 15 = 40$$

$$60 - 40 = 20$$

$$\boxed{\begin{aligned} & 40 \text{ pounds} \rightarrow \text{Rs. 40 cals. coffee} \\ & 20 \text{ pounds} \rightarrow \text{Rs. 20 cals. coffee} \end{aligned}}$$

$$= 30.00 - 25.00$$

$$= 5.00$$

$$= 25.00 \sqrt{5.00}$$

$$= .20 \overline{1500.00}$$

14 - If an article sells for Rs. 120.00 and there has been a profit of 10% of the selling price. what is the cost price?

$$10\% \text{ of Rs } 120.00$$

$$10 \times 120.00$$

$$12.00$$

$$\boxed{120.00 - 12.00 = 108.00}$$

15 Find the percent of profit based on cost price of an article costing Rs 2500 and selling for Rs 30.00

$$= 30.00 - 25.00$$

$$= 5.00$$

$$= 25.00 \sqrt{5.00}$$

$$= .20 \overline{1500.00}$$

⑯ Find The Percent of loss based on cost Price of an article costing Rs 50.00 and selling for Rs 48.00

$$50.00 - 48.00 = 2.00$$

$$\frac{50.00 / 2.00}{50.00} = \underline{\underline{5000 / 200.00}} \\ \cdot 04 = 4\%$$

$$\text{Loss} = 4\%$$

⑰ Find The Percent of profit based on the selling price of an article costing Rs 25.00 and selling for Rs 30.00

$$\frac{\text{Rs } 30.00 - \text{Rs } 25.00}{\underline{\underline{30.00 / 5.00}}} = \underline{\underline{\frac{\text{Rs } 5.00}{30.00 / 5.00}}} = \underline{\underline{\frac{1}{6}}}$$

~~$$= \frac{16.2 / 3}{16.2 / 3 \%}$$~~

⑱ Since the selling price represents the whole cost plus 25% of the cost price  
~~IPS POINTS~~

$$25.00 = 1.25 \times \text{cost price}$$

$$\text{cost} = \frac{25.00}{1.25} \\ \text{cost} = 20.00$$

29- Naeem bought used a car for Rs 6,50,000 and paid 20% deposit. How much did he still have to pay?

$$\text{Price of car} = 650000 \\ \text{Cash Price} = 20\% \text{ of } 650000$$

$$= \frac{20}{100} \times 650000 \\ = 130000$$

$$8x = 1500 \times 100 \\ x = \frac{1500 \times 100}{8}$$

$$\text{Amount Naeem} = \text{Price of car - Cash paid} \\ \text{still have to pay} \\ = 650000 - 130000 \\ = 520000$$

20- 1500 is 8% of which number  
 Let 1500 is 8% of  $x$   
 8% of  $x = 1500$

$$\frac{8x}{100} = 1500$$

$$8x = 1500 \times 100 \\ x = \frac{1500 \times 100}{8}$$

21 Nasir bought a book for Rs 80 and sold it for Rs 64. what percentage loss did he get?

$$\text{Loss} = 1885398$$

$$\text{Cost price} = 80$$

$$\text{Sale price} = 64$$

$$\text{Loss} = \frac{80 - 64}{80} \times 100$$

$$\text{Loss \%} = \frac{\text{Loss}}{\text{Cost price}} \times 100$$

$$= \frac{16}{80} \times 100$$

1

22. Which inequality shows the following statement  
If  $x$  is 6 or less and more than -5

$$-5 < x \leq 6$$

23 Expand and Simplify  
 ~~$-6(2n - 3) - 11$~~   
 $-18n + 18 - 11$   
 $-18n + 7$

$$\begin{aligned} &= -6(2x - 3) - 11 \\ &= -12x + 18 - 11 \\ &= -12x + 7 \end{aligned}$$

$$24. -5^2 + 3^2 = 25 + 9$$

$$= 34$$

$$25. 2 - 25\% \text{ of } 300$$

$$= \frac{300 \times 25}{100}$$

$$= \frac{3 \times 25}{1}$$

$$= 75$$

$$26. 200 \times 0.75$$

$$\begin{array}{r} 0.75 \\ \times 200 \\ \hline 1500 \end{array}$$

$$\boxed{15.00}$$

22

$$(y+3)(y-2) = 0$$

$$y^2 - 2y + 3y - 6 = 0$$

$$2y - 3y + y^2 + 6 = 0$$

$$(2+3)y -$$

$$2 - (4-3) + 11$$

$$2 - 1 + 11$$

$$= 18 - 1$$

$$= 17$$

~~29. Simran bought pet food worth Rs. 5600. She then sold 1/3rd of it incurring a loss of 40%. rest of the supplier to nullify this loss? 20%.~~

~~30. A shopkeeper earned a profit of 15% after selling a book at 20% discount on the printed price of the book?~~

$$\boxed{16:23}$$

~~31. The ratio of cost price and selling price is 4:5. The profit percent is~~

$$\boxed{25\%}$$

~~32. what is  $2+2 \div 2 \times 2 - 2$ ?~~

$$\boxed{2}$$

~~33. If a handbag is priced at \$ 200 and is sold at \$ 160 then the~~

~~and is sold at \$ 160 then the~~

{ Percentage discount is

$$\boxed{20\%}$$

37 - How much is 80% of 40 is greater than 415 off 25?  $\boxed{112}$

34 - Find number whose sum is 28 and the difference is 4 —  $\boxed{12,16}$

35 - what is the sum of first 20 even numbers  
 $\boxed{1970}$

38 - The average of two numbers is  $x, y$ . If one number is equal to  $x$ , the other number is equal to —

$$(2xy - 2x)$$

39 - How long will it take for a sum of Rs. 1260 to Rs 10,000 if it is invested at 12.5% simple interest for 6 years

40 - 60 is subtracted from 60% of a number, then result is 50. Find the number  $\boxed{150}$

Scanned with CamScanner

40 - A sum of money at simple interest amounts to Rs 815 in 3 years and to Rs 854 in 4 years. The sum is —

$$\boxed{698}$$

42 - A, B and C together earn Rs 150 per day while A and C together earn Rs. 94 and B and C together earn Rs. 76. The daily earning of C is —

41. Today is Khadija's birthday! After one year, she will become two times as old as she was ten years ago. Current age of Khadija

$$\boxed{21}$$

$$B = \frac{76 - 56}{20} \\ \boxed{= 1}$$

$$150 - 94 \\ 56 - 56 \\ \hline 0 = 1$$

A, B and C together earn Rs 150 per day while A and C together earn Rs. 94 and B and C together earn Rs. 76. The daily earning of C is —

$$[Do \overline{RS}] \rightarrow \text{Ans}$$

$$\text{Total} = 150 \\ A = 150 - 94$$

$$= 56$$

43 - A man works 6 days a week. To complete his work, how many days does he need?

A work, how many days does he need?

men can complete the work  
in 3 days 1.8 man

$$46 - 1.5225$$

$$= \frac{15225}{100}$$

44 -  $0.36 \rightarrow$  decimal into  
fractional

$$\frac{36}{100} = \frac{9}{25}$$

$$45 - -6.08$$

$$= \frac{-608}{100} = \frac{6}{100}$$

$$1000 / \frac{6008}{8000} = 2$$

$$2000 / \frac{12016}{8000} = 2$$

$$1600 / \frac{9603}{8000} = 2$$

$$152 = \frac{152}{25}$$

Find HCF of 8125 and

$$1000 / \frac{8}{8125}$$

$$125 / \frac{8000}{125} = 80$$

$$125 / \frac{625}{125} = 5$$

$$152 = \frac{152}{25}$$

$$51 - 2^{100} \rightarrow \text{base, exponent?}$$

48 - Rational number into terminating decimal

$$\frac{2}{100} = 0.02$$

$$49 - \frac{27}{20} = 1.35$$

$$\begin{array}{r} 1.35 \\ 20 ) \overline{27} \\ -20 \\ \hline 70 \\ -60 \\ \hline 100 \\ -100 \\ \hline 0 \end{array}$$

~~51 - JS point=03201835898~~

$$\begin{aligned} \text{base} &= 2 \\ \text{exponent} &= 100 \end{aligned}$$

$$52 - 2^4 + 7^4 = \left(\frac{2}{7}\right)^4$$

$$24 \div 24$$

$$\frac{2^4}{7^4} = \left(\frac{2}{7}\right)^4$$

$$53 - a^6 \div b^6 = \left(\frac{a}{b}\right)^6$$

$$= \frac{a^6}{b^6}$$

$$= \left(\frac{a}{b}\right)^6$$

$$54 - 13 : 3 = \boxed{m : 6}$$

$$\begin{aligned} 3m &= 13 \times 6 \\ 3m &= 78 \end{aligned}$$

$$55 - (-1)^9$$

$$\boxed{\text{base} = -1}$$

$$m = \boxed{26}$$

$$57 - m, s = \boxed{31.10}$$

$$5 \times 3 = 10 \times 3$$

$$\frac{15}{10} = 1.5$$

$$\frac{1.3}{2} = m +$$

12 کی 80 روپے میں کتنے انٹر فریب جائیں سو سے  
انٹر فریب کی نسبت 9% رہے۔ 6 کر

$$6x = x \\ 12 \times 1.18 = 12 \times 1.08 \\ x = \frac{12}{1.08} = 11.11 \text{ روپے}$$

$$\frac{12}{x} = \frac{1.12}{1.08} = \frac{1.12}{1.08} \times 80 = \boxed{142.20}$$

$$96 \times 1.12 = 12 \times 80 = \boxed{142.20}$$

$$x = \frac{12 \times 80}{96} = \boxed{10}$$

**Ques.** Find the property tax  
on a property of worth  
Rs 948.000 at the rate of  
1.5%.

$$\text{Worth of the property} = 948,000 \\ \text{Tax Rate} = 1.5\%$$

$$\text{Property Tax} = ?$$

$$\text{Property Tax} = 1.5\% \text{ of } 948,000 \\ = \left( \frac{1.5}{1000} \times 948,000 \right) \\ = \boxed{14220.1}$$

**Ques.** Harry paid the  
property tax of Rs 206

at the rate of 0.8%. Find the worth of property

$$\text{Property} = \text{Rs } 2068 \\ \text{Tax Rate} = 0.8\%$$

$$\text{Worth of property} = ?$$

By using the unitary method

$$0.8\% \text{ of worth} = \text{Rs } 2.068 \\ \text{of property}$$

$$100\% \text{ of worth} = \text{Rs} \left( \frac{2.068}{0.8} \right)$$

Property

$$100\% \text{ of property} = \left( \frac{2.068}{0.8} \times 100 \right)$$

Property

$$\Rightarrow \text{Rs } 258500$$

~~JSB MATH TIPS POINT~~

59 - The price of a toy including 5% general sales tax in Rs 745. Find the original price of the toy.

$$\text{Price of toy} = \text{Rs } 745$$

$$\text{GST} = ?$$

$$\text{Original price} = ?$$

$$\text{Price of toy} = 100\% + 5\%$$

$$\text{toy} = 105\%$$

By using the unitary method

$$105\% \text{ price of toy} = \text{Rs } 745$$

the toy

$$1\% \text{ price of toy} = \left( \frac{745}{105} \right)$$

$$\Rightarrow \text{Rs } 7.05$$

$$100\% \text{ price of the toy} = RS \left( \frac{945}{105} \times 100 \right)$$

$$= RS \frac{900}{1}$$

~~62 -  $(x+1)(x+2)$~~

$$= x^2 + (1+2)x + (1 \times 2)$$

$$= x^2 + 3x + 2$$

~~60 -  $x^2 + 2xy + y^2$~~

$$\begin{array}{r} x^2 + 2xy + y^2 \\ x^2 - 2xy + y^2 \\ \hline 12x^2 \quad 2y^2 \end{array}$$

~~63 -  $(x-2)(x-4)$~~

$$= x^2 - 4x - 2x - 8$$

$$= x^2 - 6x - 8$$

~~64 -~~

$$\frac{9}{121} \text{ ज्ये}$$

~~61 -  $a^5 + a^3b - 2ab^3, b^3, 4a^5 + 3a^2b + 2ab^3$~~

$$+ 5b^3$$

~~$a^5 + a^2b - 2ab^2 + b^3$~~

~~$4a^5 + 3a^2b + 2ab^3 + 5b^3$~~

~~$15a^2 + 4a^2b + 6b^2$~~

~~$15398$~~

$$= \frac{1156}{121} = \frac{1456}{121}$$

$$\begin{array}{r} 34 \\ \hline 3 / 1156 \\ \hline 3398 \\ - 266 \\ \hline 2121 \\ - 2121 \\ \hline 0 \end{array}$$

66- 4.21

$$\frac{34}{21} \quad \boxed{3.4 \text{ جواب}}$$

$$= \frac{121}{100}$$
$$= \frac{\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{2}}{\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{1}} = \frac{100}{50}$$
$$= \frac{2\cancel{5}}{5\cancel{5}} = \frac{2}{5}$$

65- 0.64

$$= \frac{64}{100}$$
$$= \frac{\cancel{2}\cancel{2}\cancel{2}\cancel{2}}{\cancel{2}\cancel{2}\cancel{2}\cancel{2}} = \frac{64}{100}$$

$$\frac{2\cancel{2}\cancel{2}\cancel{2}}{2\cancel{2}\cancel{2}\cancel{2}} = \frac{100}{25}$$
$$= \frac{5\cancel{5}}{5\cancel{5}} = \frac{1}{1} = 1$$

$$= \frac{11 \times 11}{2 \times 2 \times 5 \times 5}$$
$$= \frac{\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{1}\cancel{1}}{\cancel{2}\cancel{2}\times\cancel{5}\times\cancel{5}\times\cancel{5}\times\cancel{5}} = \frac{11}{11} = 1$$

$$= \frac{\sqrt{112}}{\sqrt{2^2} \times \sqrt{5^2}}$$
$$= \frac{11}{2 \times 5} \boxed{= 1.11}$$

$$67- 0.64 = \frac{64}{100}$$

$$= \frac{\cancel{2}\cancel{2}\cancel{2}\cancel{2}}{\cancel{2}\cancel{2}\cancel{2}\cancel{2}} = \frac{100}{25}$$
$$= \frac{5\cancel{5}}{5\cancel{5}} = \frac{1}{1} = 1$$

$$= \frac{2 \times 2 \times 2}{2 \times 2 \times 2} = \frac{8}{8} = 1$$
$$= \frac{10}{10} = 1$$
$$= 0.81$$

Usman TIPS point=0320183301

$$\frac{64}{100} = \frac{2 \times 2 \times 2 \times 2 \times 2}{2 \times 2 \times 5 \times 5}$$

$$4x^4(4x^2 - 4x + 1) = 0$$

$$= \sqrt{\frac{2^2 \times 2^2 \times 2^2}{2^2 \times 5^2}}$$

$$= \frac{2 \times 2 \times 2}{2 \times 5}$$

$$= \frac{8}{10}$$

$$= 0.8 \text{ Ans}$$

TIPS point=032017

$$\begin{aligned}
 68 - & x^2 + 14x + 49 \\
 & = x^2(x+7) + 7(x+7) \\
 & = (x+7)(x+7) \\
 & = (x+7)^2 \text{ Ans}
 \end{aligned}$$

$$69 - 16x^6 - 16x^5 + 4x^4$$

$$4x^4(4x^2 - 2x + 1) = 0$$

$$4x^4[4x^2 - 2x + 1] = 0$$

$$4x^4(2x^2 - 2x + 1) = 0$$

68 -

D 0214  
D 0215  
D 0216