Aptitude & Mental Ability

Tnpsc Previous Questions With Explanation - Part 3

Important Download Links

Install Tnpsc Winmeen Mobile App

Tnpsc Complete Maths Study Materials Link

1. Find the odd man out: 216,730,343,1331 ?

A)216 **B)343** **C)730** **D)1331**

$216 = 6^3$; $343 = 7^3$; $1331 = 11^3$;

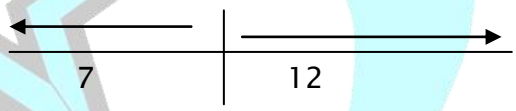
730 is not a cube , it is the odd man out

2. A student is ranked 13th from the right to him and 8th from left to him then how many students are in total in number?

A)18 **B)19** **C)20** **D)21**

To the right 12 Students

To the left 7 students and one



including him . (12+7+1)=20 students

3.In 30 litres of acid the ratio of acid and water is 2:3 . What amount of water should be added to the mixture so that the ratio of acid and water becomes 2:5?

A)19 litres **B)15litres** **C)12 litres** **D)10 litres**

Let the unknown amount be x,

In totat amount 2x+3x = 30

5x= 30 ; **x = 6**

The amount of acid and water is 12 and 18 respectively

Acid is 12 litres , water is 18 litres , in order to make it in the ratio of 2:5 ,12 litres

of water is added extra , then the ration becomes 12:30

(or)

$$\frac{Acid}{Water} => \frac{12}{18+x} = \frac{2}{5}$$

=> 12 * 5 = 2*(18 + x)

=> 60 = 36 + 2x

=> x=12litres

4. Express $233\frac{1}{3}\%$ as a fraction.

A)$2\frac{1}{3}$ B) $2\frac{1}{2}$ C) $3\frac{1}{2}$ D) $3\frac{1}{3}$

$$=> \frac{233 * 3 + 1}{300}$$

$$=> \frac{700}{300} => \frac{7}{3} => 2\frac{1}{3}$$

5.The LCM of two numbers is 20 times their HCF. The sum of HCF and LCM is 2520. If one of the number is 480 then the other number is ?

A)400 B)120 C)600 D)240

Let the HCF be x.

According to the question, LCM = 20x

LCM + HCF = 2520

21x = 2520 ; x= 120

LCM = 20 * 120 = 2400

1st number * 2nd number = 2400 * 120

2nd number = 2400 * 120/480

= 600

The other number is 600.

6. What is next come to VIJ ?

SCD, TEF, UGH, VIJ, _____ ?

A)WKL B)CMN C)UJI D) IJT

From Alphabets

s+1 = t	c+2 = e	d+2 =f
t+1 = u	e+2 = g	f+2 =h
u+1 = v	g+2 = i	h+2 =j
v+1 = w	**i+2 = k**	**j+2 =l**

The answer is **WKL**

7. A Train starts from a place A at 6 am and arrivers at another place B at 4.30 pm on the same day. If the speed of the train is 40 km per hour. Find the distance travelled by the train?

A)42 km **B)420 km** **C)430 km** **D)480 km**

By formula ;

$$\textbf{speed} = \frac{\textbf{distance}}{\textbf{time}}$$

Total Journey time $= \frac{21}{2}$ hours

Speed = 40 km/hr

Distance = Speed * time

$= 40 * \frac{21}{2}$

$= 420$ km

8. A Patient in a hospital is give soup daily in a cylindrical bowl of diameter 7 cm. If the bowl is filled with fruit juice to a height of 4 cm, then find the quantity of fruit juice to be prepared daily in the hospital to serve 250 patients.

A)37.5 litres **B)38.5 litres** **C)39.5 litres** **D)40.5 litres**

Volume of cylinder $= \pi r^2 h$

radius = 7/2 cm; height = 4 cm

Volume of cylinder $= \pi r^2 h$

$= \frac{22}{7} * \frac{7}{2} * \frac{7}{2} * 4 = 154$

for 250 patients = 250 * 154 = 38500 cm^2

= 38.5 litres

9. In a compound Interest, the sum 20,000 will turned the amount 26,620 at 10% rate of interest per annum then the number of years is

A)2 years **B)3 years** **C)4 years** **D)5 years**

p=20000 ; amount = 26620; r =10% ; n=?

Amount for compound interest = $p*(1+\frac{r}{100})^n$

where p = principle; r = rate of interest; n = no. of years

=> 26620 = $20000\left[1+\frac{10}{100}\right]^n$

=> 26620 /20000 = $\left(1+\frac{10}{100}\right)^n$

=> $(11/10)^n = 26620 / 20000$

=> $(1.1)^n = 1.331$ **($11^3 = 1331$)**

so 'n' is 3 years

10. An iron right circular cone of diameter 8cm and height 12 cm is melted and recasted into spherical lead shots each of radius 4mm. How many lead shots can be made?

A)75 **B)750** **C)7500** **D)480**

Volume of cone $= \frac{1}{3}*\frac{22}{7}*r^2*h$; Volume of sphere $= \frac{4}{3}*\frac{22}{7}*r^3$

r= radius ; h= height ; r= 4 ; h=12 r= 4mm = 0.4 cm

volume of cone $= \frac{1}{3}*\frac{22}{7}*4*4*12$ Volume of sphere $= \frac{4}{3}*\frac{22}{7}*0.4*0.4*0.4$

$\frac{\text{Volume of cone}}{\text{Volume of sphere}} = \frac{3000}{4}$

=750 leads

11. Find the number which is 35% less than 260.

A)170 **B)169** **C)168** **D)167**

Let the number be x. 'x' should be 35% less than 260, so the number should be 65% of 260.

65% of 260 $= \frac{65}{100} * 260$

$= 169$

12.Now Sharma age is quarter as old as his father. Six years ago the father's age was seven times as old as Sharma. Find the present ages?

A) 8,32 **B)10,40** **C)12,48** **D)14,56**

Let the present age of Sharma and his father be x and 4x respectively

6 years ago,the age was

$=> \frac{x-6}{4x-6} = \frac{1}{7}$

$=> 7(x-6) = (4x-6)$

$=> 7x-42 = 4x-6$

$=> 7x-4x = -6+42$

$=> 3x = 36 => x= 12$

so the present age is 12,48

(or)

From the options

12,48 present age (**quarter of father**)

(12-6,48-6)=(6,42) **7th of father's age**

13. The ratio of ages of Muthu and Karthi at present is 5:3. But 6 years ago the ratio is 3:1. What is the ratio of their ages after 5 years?

A)5:4 **B)10:7** **C)10:8** **D)4:3**

If years is ago then subtract from the present age,

If year is after then add from the present age,

$=> \frac{5x-6}{3x-6} = \frac{3}{1}$

$(5x-6)*1 = 3*(3x-6)$

$-6+18 = 9x-5x$

$4x = 12$; **x=3**

so the present age is 15:9

After 5 years is (15+5) : (9+5)

20:14 => **10:7**

14.Read the following mathematical truths and statements given below:

Truth:

- **All natural numbers are integers**
- **Some intergers are not Natural numbers**
- **All Integers are rational numbers**
- **Some rational numbers are not intergers**

Statements:

1. **Some natural numbers arenot rational numbers**
2. **All natural numbers are rational numbers**
3. **All intergers are natural numbers**
4. **All rational numbers are intergers**

Among above four statements which is /are true statemenst(s)

A) 1 only **B)1,2 only** **C)2 only** **D)2,3 only**

Considering the truth statemenst All the natural numbers are rational numbers only follows , so only 2 follows

15. What is the sum of all 3 digit natural numbers, which are divisible by 8?

A)61376 **B)63176** **C)67136** **D)61636**

The three digits numbers are from 100-999

so numbers which are divided by 8 starts from 104 and ends in 992

the number series will be 104+112+120+.....+992

t(n)=a+(n-1)d

992=104+(n-1)8

8n = 992-104+8

8n = 896 => n=112

To find the 'n' terms in A.P is $\frac{n}{2}(a+l)$;

Substitue a = 104, d = 8, l = 992 and n = 112, we get

= 112/2{104+992}

= 56x1096

= **61376**

16.If a train going at a speed of 150 kmph takes 18 seconds to cross a signal post. What is the length of the train?

A)750m **B)500m** **C)700m** **D)650m**

$$\textbf{speed} = \frac{\textbf{distance}}{\textbf{time}}$$

Speed =150kmhr ; time = 18 sec

distance = speed * time

$= 150 * 18 * \frac{5}{18}$

= 750m

To convert km/hr into m/sec

multiply by 5/18

17. Take any number in your memory. Add 9 with that number and then twice it. Add 3 with the answer and then thrice it. Subtract 3 from the answer and divide it by 6. From the answer subtract the number taken by you initially. Final answer arrived is?

A)9 **B)20** **C)23** **D)10**

The answer is 10

18.If MILK is coded as NKPS then POT is coded as

A)QNS B)QQX C)RQU D)RSV

M+1=N

I + 2=K

L+4 =P

K+8=S

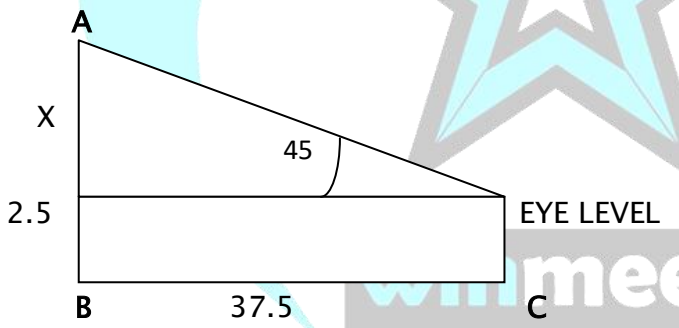
P + 1 =Q

O + 2= Q

T + 4 = x

19. A girl is 37.5m away from a tower. Her eye level above the ground is 2.5m. The angle of elevation of the tower from her eyes is 45 degree. What is the height of the tower?

A)35m B)37.5m C)40m D)42.5m



Applying Pythagorean theorem ,

$$\tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$\tan 45^{\circ} = \frac{x}{37.5} \qquad (\tan 45^{\circ} = 1)$$

x= 37.5 * 1 = 37.5m

Total height of the tower is x+2.5

$= 37.5+2.5 = 40m$

20. Simplify : $\frac{\sqrt[3]{1728}+\sqrt[3]{343}}{\sqrt{625}-\sqrt{36}}$

A)4 **B)3** **C)2** **D)1**

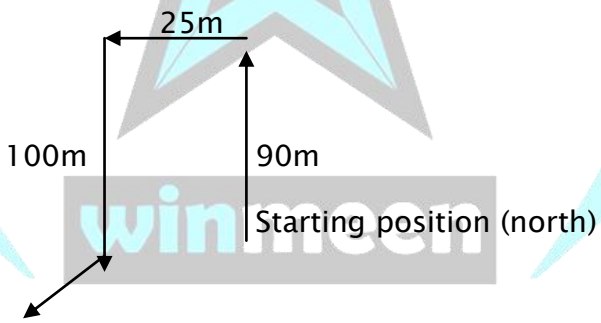
$\sqrt[3]{1728} = 12$; $\sqrt[3]{343} = 7$; $\sqrt{625} = 25$; $\sqrt{36} = 6$

$=> \frac{12+7}{25-6} => \frac{19}{19}$

$= 1$

21. Varun moved a distance of 90 meters towards the north. He then moved turned to the left and walking for about 25 metres, turned left again and walked 100 metres. Finally he turned to the right at an angle of 45°. In which direction was he finally moving?

A)NORTH-EAST **B)NORTH-WEST** **C)SOUTH-EAST** **D)SOUTH-WEST**



22.The radius and height of a cylinder are in the ration of 5:7. If its volume is 4400 cu.cm, find the radius of the cylinder?

A)6cm **B)8cm** **C)10cm** **D)12cm**

Volume of the cylinder $(V) = \pi r^2 h$;

r=radius and h= height;

let the unknown be x , the ratio of radius and height be 5x:7x

$V=\frac{22}{7}*5x*5x*7x$

$\frac{22}{7}*5x*5x*7x = 4400$

$550\ x^3 = 4400$

$x^3 = 8$; so **x=2**

the radius is $5x = 5*2 = 10$

23. The mean mark of 75 students was found to be 35. Later on it was found that as score of 32 was misread as 23. Find the correct mean corresponding to the correct score.

A)35.12 **B)35.21** **C)35.23** **D)35.32**

Mean $=> \frac{x}{75} = 35;$

$x = 35 * 75 = 2625$

Correct mean $= \frac{2625-23+32}{75}$

$= 35.12$

24. Simplify : $[\frac{1}{64}]^0 + \sqrt{64} + 32^{4/5} - 32^{-4/5}$

A)13(1/16) **B)15(3/16)** **C)17(1/16)** **D)19(3/16)**

$=[\frac{1}{64}]^0 + \sqrt{64} + 32^{4/5} - 32^{-4/5}$

$=1+8+(\sqrt[5]{32})^4-(\sqrt[4]{\sqrt[5]{32}})$

$=1+8+8-\frac{1}{16}$

$=17\frac{1}{16}$

25. How can we called the following sequence 1,1,2,3,5,8,13,21,34....?

A)Ficconabi sequence **B) Finacabci sequence**

C) Fibonacci sequence **D)Finabocci sequence**

Fibonacci sequence is adding the number before it

26. A sum of money increases 5 times its principal at 8% per annum over a certain year. Find the number of years?

A)25 B)50 C)75 D)100

Money five times itself then, the total Amount is 5 times the principle,

If the principle is 100 then the Amount is 500 and the Interest is 400

Simple Interest $=\frac{p*n*r}{100}$ where p=principle, n=no of years, r= rate of interest

Let the principle be 100 then the interest is 400

$400 =\frac{100*8*n}{100}$;

by solving we get n=50

so it takes **50** years to five itself in 8% interest rate.

27. Let r% be the rate of interest paid and P be the monthly instalment paid for 'n' months then maturity amount is ?

Forumla for maturity = p'n' + $\frac{pnr}{100}$

where p =principle; n =no of years; r= rate of interest ; 'n' no of months

28.The average marks of 50 students is 40. The mark of a student is wrogly taken as 35 instead of 85. Find the correct average of 50 students by taking the correct mark of a students?

A)38 B)39 C)42 D)41

Old average = $\frac{x}{50} = 40;$

x= 40 * 50 = 2000

New Average = $\frac{2000-35+85}{50}$

= 41

29. What would be the next term of the sequence 2,5,9,19,37?

A)67 B)76 C)75 D)87

=> 2 5 9 19 37 x

2*2+1=5

5*2-1=9

9*2+1=19

19*2-1=37

37*2+1=75

x=75

30. An Aeroplane is called ship, ship is called train, train is called as tractor, tractor is called bus, bus is called as car, car is called as scooter. Which is used to plough a field?

A)Train **B)Tractor** **C)Bus** **D)Car**

Tractor is used to plough the field, but in this question tractor is called as Bus

So the answer is Bus

31.Choose the correct option to complete the alphabet letter series

A_BCCB_CA_CCA_BAAB_C?

A)ABABC **B)ABCAA** **C)ACCAB** **D)BACAA**

By finding a logical and similar pattern

AABCC|BBCAA|CCABB|AABCC

32.Radius of a cylinder is increased by 10%then percentage increase in its volume is

A)20% **B)15%** **C)10%** **D)21%**

Volume of cylinder $= \pi r^2 h$

let r=10, h=10

volume of the cylinder=1000π

volume of new cylinder radius with 10% increase is r=11 h=10

volume of the new cylinder =1210 π

`change in percentage = (new-old)/ 100

$$= \left[\frac{1210-1000}{1000}\right] * 100$$

=21%

33. If $P=\frac{x}{x+y}$; $Q=\frac{y}{x+y}$ then, what is the value of $\frac{1}{P-Q}-\frac{2Q}{P^2-Q^2}$ =?

A) x+y B) 1 C) -1 D)x-y

First find P-Q, P+Q

$P-Q=\frac{x-y}{x+y}$: $P+Q=1$

then substitute , $\frac{1}{\frac{x-y}{x+y}}-\frac{\frac{2y}{x+y}}{\frac{x-y}{x+y}}=\frac{x+y}{x-y}-\frac{2y}{x+y}*\frac{x+y}{x-y}$

$=\frac{x+y}{x-y}-\frac{2y}{x-y}$

$=\frac{x-y}{x-y}$

$=1$

34.Simplify : $\log_3\sqrt{5x+1}-(1/2)=\log_3\sqrt{x+1}$

A)0 B)1 C)2 D)3

If the bases of the log are equal then , we can equate

$\sqrt{5x+1}-\frac{1}{2}=\sqrt{x+1}$

$\sqrt{5x+1}-\sqrt{x+1}=\frac{1}{2}$

squaring on both sides and solving we get

x=1

35. A train takes 18 seconds to pass through a platform 162m long and 15 seconds to pass through another platform 120m long then the length of the train is ?

A)90m B)100m C)110m D)120m

$$\text{speed}=\frac{\text{distance}}{\text{time}}$$

Speed of the train is same , so we can equate $\frac{distance}{time}$

speed $1=\frac{162+x}{18}$

speed 2=$\frac{120+x}{15}$

equating speed 1 and speed 2

$\frac{162+x}{18} = \frac{120+x}{15}$

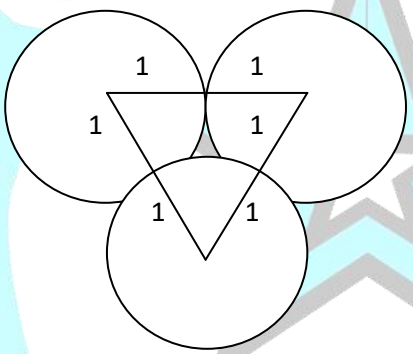
15(162+x)=(120+x)18

810+5x = 720+6x

x= 90m

36. Three coins each 2 cm in diameter are placed tocuchin one another. Find the area enclosed by them (π =1.732) (Approximately three decimal places)

A)0.161cm² B)0.151cm² C)0.171cm² D)0.181cm²



All the radius are same , so it is an equilateral triangle, the degree for equilateral triangle is 60

Area of the equilateral triangle=$A = \frac{\sqrt{3}a^2}{4}$

$A = \frac{\sqrt{3}*2*2}{4} = 1.732$

Sector ABC =$A = \frac{1}{2}r^2\theta$;

A=$\frac{1}{2} * 1 * 1 * \frac{\pi}{1}$ =1.57

Area between triangle =(Area of equilateral triangle−Area of sector ABC)

=1.732−1.57

= 0.161cm²

37. A man is 114 metres behind a boy. The man runs 21 metres in a minute and the boy runs 15 metres in a minute. In what time they will meet ?

A)18 min B)19 min C)20 min D)36 min

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

time = distance * speed ;

$$\text{time} = \frac{114}{\frac{21}{60} - \frac{15}{60}} = \frac{114}{\frac{6}{60}}$$

$$= 114 * 10$$

time = 1140 /60

= 19 min

38. If

1. P is taller than Q
2. R is shorter than P
3. S is taller than T but shorter than Q then who among them is the tallest.

A)P B)Q C)S D)T

P > Q > S > T

R

P is the tallest among all

39. What is the sum of the first 60 terms of the series $1^2-2^2+3^2-4^2+.....+60^2$?

A)-1830 B)1830 C)7260 D)-7260

If both the signs are present,

then => $-\frac{(n+1)\,n}{2}$

$$=> \frac{-60\,(61)}{2}$$

=> - 30 * 61

=> -1830

40. 5 men and 2 boys working together can do four times as much work as a man and a boy can do then ratio of working capacities of a man and a boy are in the ratio ?

A)5:2 **B) 1:3** **C) 2:1** **D)2:5**

Let men be 'm' and boy be 'b'

5m + 2b = 4

m + b = 1

Multiplay equation 2 by 2

5m + 2b = 4 ⟶ 1

2m + 2b= 2 ⟶ 2

3m =2

m= 2/3

sub m=2/3 in equation 2, we get

b=1/3

so the ratio of men: boy is 2:1

41. What would come as the next element in the alpha numeric series?

A1Z , F2X, K4V, P8T, ?

A)Q10U **B)U16R** **C)R16V** **D)U10V**

A + 4 = F	1*2=2	Z -1=X
F + 4 = K	2*2=4	X-1=V
K + 4 =P	4*2=8	V-1=T
P + 4 =U	**8*2=16**	**T-1=R**

42. Find the sum of series upto infinity 625+125+25+5+..

A)500.25 B)718.25 C)755.25 D)781.25

The series is, 625+125 + 25 + 5 + 1 +.....

a_1 = 625 ; r= 125/625

=1/5

The formula for the resultant sum of the Infinite Geometric Series is,

$S\infty = \frac{a1}{1-r}$;

$S\infty = \frac{625}{1-\frac{1}{5}} = \frac{625}{\frac{4}{5}} = \frac{625 * 5}{4}$

$S\infty$ = 781.25

43. A water pipe can fill an empty tank in 50 minutes while another pope can empty the filled tank in $1\frac{1}{4}$ hours. How long minimum time will it take to fill the emptied tank when both pipes are opened simultaneously?

A) $1\frac{1}{4}$ hours B) $2\frac{1}{4}$ hours C) $2\frac{1}{2}$hours D) 3hours

A can fill in $\frac{5}{6}$ hours ; B can empty in $\frac{5}{4}$ hours

$=> \frac{6x}{5} - \frac{4x}{5} = 1$

$=> \frac{2x}{5} = 1$

$=> x = \frac{5}{2}$ hours

44. Working hours of an office is morning 9.30 to evening 5.30. There will be a Lunch break between 12 noon and 1.15 pm. If the office functioning 6 days in a week. What is the total working hours of the office during a week.

A)36 hours 10 minutes B) 36 hours C) 40 hours 30 minutes D) 38 hours

Working hours = 9.30 hours to 5.30 hours (17.30 hrs)

= 17.30 – 9.30

Working hours = 8.00 hrs (including lunch break)

Lunch break = 12 noon to 1.15 p.m (13.15 hrs)

= 13.15 – 12

Total lunch = 1.15 hrs

Total working hours = 8.00 – 1.15 (excluding lunch break)

= 6.45

For 6 days = 6 * 6.45

= 40 hours 30 minutes

45. The 17th term and 27th term of an arthimetic progression are 100 and 150 respectively. What is its 37th term?

Formula for arthimetic progression is

$t(n) = a + (n-1)d$

$a + (27 - 1)d = 150$ ⟶ 1

$a + (17-1)d = 100$ ⟶ 2

$10d = 50$

$d = 5$

substitute d=5 in equation 2 , we get

$a + 16*5 = 100$

$a = 20$

for 37th term,

$t(n) = 20 + (37 - 1)\ 5$

$t(n) = 20 + 180$

$t(n) = 200$

46. The radii of two right circular cylinders are in the ratio of 3:2 and their heights are in the ratio of 5:3. Find the ratio of their curved surface areas

A)5:2 **B)2:5** **C3:2** **D)5:3**

Let the radius be 3x and 2x ; and their heights be 5x,3x

Curved surface of cylinder $= 2\pi rh$

$$\frac{\text{first cylinder}}{\text{seconde cylinder}} \rightarrow \frac{2 * \pi * 3x * 5x}{2 * \pi * 2x * 3x}$$

the ratio is 5:2

47. A number consists of two digits whose sum is 9. The number formed by reversing the digits decreases twice the original number by 9. Which is that original number?

A)63 **B)36** **C)62** **D)26**

From the option =>63

63 => reversing we get 36

twice of 36 and 9 less is 36 * 2 -9 =63 (the original number)

48.A rubber ball is dropped from a height of 25m, which strikes the ground and rebounds everytimes to the half of the height from where it falls down. What is the total distance travelled by the ball to come to the rest position?

A)75m **B)175m** **C)125m** **D)150m**

Let the initial position = 25

progression for infinity $= \frac{a}{1-r}$

a = 25, r = 12.5/25 =>1/2

$=> \quad \frac{25}{1-(\frac{1}{2})} => \frac{25}{1/2} => 50$

This only accounts for half of the travel, we need to take in account the bounce back.

So, we multiply it by 2.

50 * 2 =100

total = last – initial

total = 100 – 25

= 75 m

49. The radius of solid sphere and solid hemisphere is same. Then the ratio of curved surface area of the solid sphere, total surface area of the solid hemisphere and curved surface area of solid hemisphere is

A)4:3:2 **B) 4:2:1** **C)3:2:1** **D)2:1:1**

Curved surface area of sphere = $4\pi r^2$

Curved surface area of hemi sphere = $2\pi r^2$

total surface area of hemi sphere = $3\pi r^2$

The ratio is $4\pi r^2 : 3\pi r^2 : 2\pi r^2$

The ratio is 4:3:2

50. A gardener plans to construct a trapezoidal shaped structure in his garden. The longer side of side of trapezoid needs to start with a row of 100 bricks. Each row must be decreased by 1 bricks on each end and the construction should stop at 25^{th} row. How many bricks does he need to buy?

A)1500 **B)1700** **C)1900** **D)2000**

The longer side of trapezoid shaped garden is containing 100 bricks and each row must be decreased by 1 on each end and the construction must stop when it reaches the 25th row.

If we write the number of bricks in each row as sequence we will get 100,98,96,.....

Now we nee to find number of bricks needed to buy. For that we have to make it as series and we have to find for 25 terms of the series.

$S_n = (n/2)\,[2a+(n-1)d]$

a = 100 d = 96–98 n = 25; d = –2 ;

S_{25} = (25/2) [2(100) + (25–1) (–2)]

= (25/2) [200 + (24) (–2)]

= (25/2) [200 – 48]

= (25/2) (152)

= 25 x 76

= 1900 bricks