

# RRB NTPC Mathematics Mega PDF from Phase 2



## RRB NTPC Mathematics Asked Question in Phase-2

If  $a^2 + b^2 = 8$  and  $ab = 4$  then find the value of  $a + 1/a$ .

A man of height 1.5 m sees a minaret 28.5 m away from him and the top of minaret makes 45 degree of elevation angle with his eyes. Find the total height of the minaret.

A principal sum of Rs.18,000 was lent at 4% interest rate for 1 year. Find the compound interest accumulated when compounded half-yearly.

On selling 20 articles for Rs.20,000, the seller earned a profit equal to the cost price of 5 articles. Find the cost price of one article.

In a right-angle triangle ABC,  $\tan A = \sqrt{3}$  then find the value of  $\sin A \cdot \cos C + \cos C \cdot \sin A$

If  $(a^3 + b^3)/(a^3 - b^3) = 185/158$  then find  $a/b$ . Find the value of  $\sin 15^\circ$ .

Solve:  $1254 + 125.4 + 12.54 + 1.254$

Find the area and the perimeter of an equilateral triangle whose side length is 4 cm. If

$a = 1/3$ ,  $b = 1/4$  and  $c = 1/5$  then find  $a:b:c$ .

Find the diameter of a circle whose circumference is 8.8 m. If  $\sin \theta + \operatorname{cosec} \theta = 2$  then find  $\sin^8 \theta + \operatorname{cosec}^8 \theta$ .

If A, B and C can complete a work in 12, 15, 20 days respectively then find the number of days in which they will do the same work together.

The efficiency of Mukesh is twice of Kamlesh. They both can complete the work in 22 days. In how many days Mukesh can complete the work.

The sum of investments of A, B and C is Rs 33000. Total profit earned by them is Rs 15000. If the profit of A & B are Rs 4500 & Rs 5500 respectively. Then find the investment of C.

$\cos(75+x) - \sec(15-x) + \tan(55+x) - \cot(35-x) = ?$

What number should be added to 5474 so that it will be completely divisible by 3, 4, 6 and 8.

Length of the rectangle is 10% more than its breadth. If the area of the rectangle is 110, find the breadth of the rectangle.

$(a^3+b^3)/(a^3-b^3) = 185/158$ , then find a:b Which is not the multiple of 7?

Ans: 50

If  $\sqrt{15} = 3.87$ , then  $\sqrt{3}/\sqrt{5} = ?$

Two concentric circles have radii 21 cm and 7 cm respectively. Find the area between the circles.

If  $\sin A = \frac{1}{2}$  &  $\cos B = \frac{1}{2}$ , then find the value of A+B.

If the investments of A & B in a business is 1.5 lakhs and 1 lakh respectively and the profit is Rs 24000, then find the share of A & B in the profit.

8 litre of milk is withdrawn from 80 litre milk and replaced by water, this process is done twice. Find the ratio of milk and water in the final mixture.

A man covers a half distance at 10 km/hr and half at 20 km/hr. If the total time taken by him is 10 hours then find the total distance?

A can do a certain work in 40 hours and A+B together can complete the work in 30 hours. In how much time will B alone complete the work?

A consumer has to pay Rs 279 after a 10% discount on the electricity bill. What is the original bill?

In triangle ABC, the sum of angle A and angle B is  $90^\circ$ . If  $\sin A = \frac{5}{3}$ . Find the value of  $\tan B$ .

If the cost price of 10 pens is equal to the selling price of 8 articles, then find the profit/loss percentage.

0.23 is a/an \_\_\_\_\_ number.

Find the area enclosed between two concentric circles of radii 7 cm and 14 cm.

Find the time taken by a train moving with the speed of 60 kmph to cross a bridge of 600 m. The length of the train is 400 m.

Find the third proportional of 16 and 40.

In what time ₹1600 amounts to ₹2116 at 15% per annum interest rate compounded annually.

The square of  $\sqrt{3} + \sqrt{11}$  is a/an \_\_\_\_\_ number.  $1 + \tan 15^\circ \cdot \cot 75^\circ = ?$

A&B can do a piece of work in 15 days, B & C can do the same work in 12 days and C & A can do it in 20 days. In how many days A, B and C together can complete the work?

In a triangle ABC, the sum of the angles A & B is 90 and  $\sin A = \frac{3}{5}$ . What is the value of  $\tan B$ .

If the total surface area of the cube is 1944, then find the volume of the cube. Find the mean of the first 8 prime numbers.

If  $\text{mean} = \frac{3\text{median} - \text{mode}}{p}$ , then find the value of p.

If the number is first increased by 5% and then decreased by 5% then what is the net effect?

If  $x = 5$  and  $y = 2$ , then  $16x^4 - 40x^2y + 15y^3 = ?$  Value of  $\sin 15^\circ$ .

If  $A/4 = B/5 = C/6$ , Find A : B : C.

Ratio of Two numbers is 1 : 7. If the LCM of the numbers is 721, find the sum of Numbers.

A sum of money becomes Rs.13000 in 6 years and Rs.15000 in 9 years. Find the rate of interest.

If  $\sin(48^\circ + \theta) = \cos(\theta)$ . Find the value of  $\theta$ .

In a circle of radius 10 cm, an arc of 125 degree is made. Find the perimeter of the sector formed.

If  $\tan\theta = \frac{3}{4}$  then find the value of  $\sec\theta$ .

A ladder makes a 45 degree angle with the top of the wall and is  $4\sqrt{5}$  m away from the base of the wall. Find the length of the ladder.

If  $\cos 45^\circ = \frac{(4\sqrt{2})}{x}$  then find the value of x.

If A can complete  $\frac{2}{5}$  part of a work in 12 days and B can complete  $\frac{3}{4}$  part of the same work in 25 days. Find the time taken by them to complete the double amount of work together.

A man covers a certain distance in 45 mins at 42 km/hr speed. How much speed should he increase to cover the same distance in 35 mins?

Two numbers are in the ratio of 7:1 and their HCF is 19. Find the LCM.

The ratio of volume of two cubes is 64 : 1331. Find the ratio of their total surface areas.

Find the area of a rhombus whose side is 25 cm and one of the diagonals is 14 cm. If

in a  $\triangle ABC$ ,  $\angle A = 30^\circ$  and  $\angle B = 45^\circ$ , then find the value of  $\cot C$ .

Which of the following is a prime number: 64, 82, 157, 1331

At simple interest, an amount grows to Rs 12000 in 6 years and Rs 15000 in 9 years. Find the rate of interest.

$(\tan 88^\circ \cdot \tan 2^\circ)(\tan 87^\circ \cdot \tan 3^\circ) \dots (\tan 45^\circ \cdot \tan 45^\circ) = ?$

Find the LCM of  $\sqrt{169}$ ,  $\sqrt{27}$ ,  $\sqrt{64}$  and  $\sqrt{144}$ .

Seema has few rupees and spent 6.25% of her rupees which was equal to 75 rupees. How much money did he have?

The population of a city becomes 640000 after 2 years at the rate of 5%. What was the population of the city 2 years ago?

Find the value of  $p^2 - 7p + 12$  if  $p = 3$ .

A shopkeeper got a loss of 7% after selling an article for Rs 31. What is the profit percentage if he sells it for Rs 35.



$$(\sqrt{5} - \sqrt{11})(\sqrt{5} + \sqrt{11}) = ?$$

Reena and Riya can do a piece of work in 6 days and Riya can do it in 8 days. In how many days Reena will complete the work.

A student required minimum 60% marks to pass the exam. If he got 60 marks and got failed by 60 marks. What is the maximum marks of the exam?

A and B can complete the work in 12 days and 16 days respectively. If they work on alternate days starting with A , then in how many days the work will be completed.

$(\sqrt{5} - \sqrt{7})$  is a/an \_\_\_\_\_ number.

The largest chord of a circle is 10 cm. Find the radius of the circle. Third proportional to 12 and 15 is:

0.05 cm represents 1 km on a graph. If the actual area of a patch of land is 8000 km<sup>2</sup>, then find how it will be represented on the graph.

Average of 20 numbers was calculated to be 22.5 which incorporated a mistake of taking 25 as -25. Find the actual average.

Point A and B lie on a circle. Two tangent lines are drawn from A and B which intersect at P. If AP = 12 cm and  $\angle APB = 60^\circ$ , find length of AB.

Find the irrational number between 3 and 5 :  $\sqrt{3}$ ,  $\sqrt{5}$ ,  $\sqrt{27}$ ,  $\sqrt{17}$ .

If the HCF of 85 and 153 is equal to  $85x - 153$ , then find the value of x. Find the total surface area of a hemisphere whose diameter is 7 cm.

Two cones, whose slant heights are 3 cm and 4 cm respectively, have equal diameters. Find the ratio of their curved surface areas.

Which of the following has terminating decimal:  $\frac{2}{3}$ ,  $\frac{3}{7}$ ,  $\frac{2}{5}$ ,  $\frac{2}{9}$

If the loss percentage on Rs.52500 is 25% then what is the loss amount in rupees. If

$$x + y = 75 \text{ and } x^2 - y^2 = 300, \text{ then } x - y = ?$$



A and B can do a work together in 12 days. If A takes 24 days to finish the work alone, then in how many days can B do the work individually?

If  $\cos A + \sec A = 2$  then  $\cos^6 A + \sec^6 A = ?$

If  $\sin A = \frac{3}{5}$ , then find the value of  $(\cos A + \tan A)/3\cot A$  If  $x\%$  of  $50 = 20$ , then the value of  $x$  is?

If an item is bought 15 for 3 rupees and sold 6 for 2 rupees, then find the profit or loss?

Ram's income is 25% more than Shyam's, then Shyam's income is how much percentage less than Ram's?

Two circles have radius in the ratio  $1 : 4$ , then what is the ratio of their areas? Product of two numbers is 190. Find their LCM?

Height of 3 woodens logs are 48, 56 and 72. Find the maximum height of scale needed to measure all three logs. (Find the HCF and that would be the height)

CP of 15 products is Rs. 3. SP of those product is Rs. 2. Find the profit/loss percent. The population of a city is 6400. If the population increases at the rate of 10% every year. Find the population after 2 years.

Ratio of the angles of the quadrilateral was given and was asked to find the value of the smallest angle.

The side of a cube is increased by 50%. Find the percentage change in the surface area of the cube?

$\frac{\sqrt{7}+\sqrt{2}}{\sqrt{7}-\sqrt{2}} = x + \sqrt{14}y$ ; Find the value of  $y$ .

If the area of a rhombus whose side is 17 cm and one of the diagonals is 16 cm. Find the number of multiples of 7 between 200 and 1000.



The ratio of the ages of Ram and his father 1 : 4. If four years ago, the ratio of their ages was 1 : 6. Find the present age of Ram's father.

Find the mean of 10, 12, 14, 16, 18, 20, 26, 28.

$$\frac{0.25}{0.025 \times 0.0025 \times 25} = ?$$

Find the area of the square made by joining the mid-points of the sides of a square with area 36 cm<sup>2</sup>.

A car overtakes a pedestrian moving at 4 kmph and the pedestrian can see the car for 4 minutes. When the car disappeared, the distance between the pedestrian and the car was 300 m. Find the speed of the car.

A shopkeeper earns 20% profit by selling a product. Were the cost price as well as the selling price ₹100 less, the profit would be 4% more. Find the cost price of the product.

Find the smallest possible multiple of 7 which when divided by 6, 8 and 16 leaves 3 as remainder in each case.

Find the largest number that should be subtracted from 1391 so that when the resultant number is divided by 7, 9 and 11, the remainder obtained is 3 in each case.

Find the remainder when  $7^{13} + 1$  is divided by 6.

Two points P and Q lie on the same side of a tower. Point P and Q are 16 cm and 25 cm away respectively from the foot of the tower. Find the height of the tower if the angles of elevation of P and Q with respect to the top of the tower are complementary.

If  $a = x+y$ ;  $b = x-y$ ;  $c = 1-2x$ ; Find the value of  $a^2+b^2+c^2 + 2(ab+bc+ca)$

If one fifth of 30% of a number is equal to two thirds of 40% of another number, then find the ratio of the two numbers.

If  $\tan \theta = a/b$ , then find the value of  $\sin \theta + \cos \theta$ .

A person travels half of a journey at 30 kmph and the remaining journey at 50 kmph. Find the average speed during the journey.



Find the compound interest earned on ₹1400 at 20% per annum interest rate in 18 months.

The sum and the product of two numbers are equal to 25 and 35 respectively. Find the sum of the reciprocals of the numbers.

The area of a rectangular plot is 690 m<sup>2</sup>. Find the length of the wire required to fence the plot if one of the sides measuring 30 cm is to be left unfenced.

A does a piece of work in 12 days and B does the same work in 4 days. In how many days will they complete the same work if they work together.

If  $\sin A = 1/p$ , then  $\cos A = ?$

$$\frac{1}{\sqrt{2+1}} + \frac{1}{\sqrt{3+\sqrt{2}}} + \dots + \frac{1}{\sqrt{100+\sqrt{99}}} = ?$$

A fruit vendor purchases 8 apples for ₹12 and sells 6 apples for ₹10. Find the percentage of profit/loss incurred.

The difference between length and breadth of a rectangle is 1 cm. Find the length and breadth of the rectangle if its perimeter is 14 cm.

A takes 16 days to complete a work, whereas B completes 1/4th of the work in 4 days. Find the time taken to complete the work together.

Find the difference between the largest and smallest six digit numbers.  $64.916 + 1.456 - 25.326 = ?$

If a sum of money doubles in 4 years 4 months at simple interest. In how many years will the sum become three times the original amount at the same rate of interest.

The ratio of two numbers is 5 : 6. If the HCF of the numbers is 6, then find the LCM of the numbers.

If the arithmetic mean of  $a/2$ ,  $a$ ,  $a/3$ ,  $a/4$  and  $a/6$  is 6, then find the value of  $a$ .

The difference between simple interest on a sum of money at 8% interest rate for 3 years and simple interest on the same sum of money at 9% for 2 years is Rs. 96.

Find the Principal sum.

Ans: Rs.1600

A principal sum yields Rs.225 as compound interest for the 1st year and Rs.236.25 for the 2nd year as compound interest. Find the Interest rate.

Ans: 5%

Two pipes can fill a tank in 6 hours, 8 hours respectively and another pipe can empty the same tank in 12 hours. Find the time taken by all three pipes to fill the tank when opened together.

Ans: 4.8 hours

If  $\frac{3\sqrt{5}-5}{3\sqrt{5}+5} = a + b\sqrt{5}$ . Then find the value of b.

Ans: -3/2

Solve:  $5 \times 0.5 \times 0.05 \times 0.005 \times 500$

Ans: 0.3125

Find the difference in medians in two cases for the following data set 30, 20, 40, 10, 50, 70, 60, 80, 90 when 30 is replaced by 100.

Ans: 10

A + B can complete a work in 18 days and B + C can complete the same work in 24 days. If the ratio of efficiency of A to C is 2:1 then find the number of days in which C completes the 1/3rd of the total work.

Ans: 12 days

How many three-digits numbers are which give 3 as remainder when divided by 7.

Ans: 128

If  $x - 1/x = 5$  then find  $x^4 + 1/x^4$ . Ans: 727

In a room of dimensions 18 m 72 cm and 13 m 20 cm, how many square tiles of maximum dimensions can be fit?

Ans: 4290

What number should be added to 4228 to make it a perfect square? Ans: 128

Find the least number which gives 3 as remainder in each case when divided by 12, 24, 36.

Ans: 75

A man moves 120 m from point B to point A towards a minaret and  $\tan A = \sqrt{3}$  and  $\tan B = 1/\sqrt{3}$ . Find the height of the minaret.

Ans:  $60\sqrt{3}$  m

$4862 \times 9a^2$  is completely divisible by 12 then find the minimum value of a. Ans: 1

Rohit sells an article to Mohit at 15% profit and Mohit further sells it to Shayam at 10% profit. Shayam buys it for Rs. 5060. Then find the Cost price for Rohit.

Ans: Rs.4000

10% of A = 35% of B = 20% of C. Find the ratio of A:B:C. Ans: 14:2:7

The angles of a triangle are such that  $2A = 3B = 6C$ . Find angle C. Ans: 30 degree

Find the number of rotations taken by a road roller's cylindrical drum of radius 80 cm and height 77 cm when it rolls an area of  $96.8 \text{ cm}^2$ .

Ans: 25

On selling mangoes at Rs.84 per dozen a seller earns 12% profit. Find the selling price of one mango if he wants to earn 20% profit.

Ans: Rs. 7.50

If  $x^2 = y + z$  and  $y^2 = x + z$  and  $z^2 = x + y$  then find  $1/(x+1) + 1/(y+1) + 1/(z+1)$ . Ans: 1

The perimeter of a rhombus is 164 cm and one diagonal length is 80 cm. Find the area of the rhombus.

Ans:  $720 \text{ cm}^2$

If  $x + 1/x = 5$ , find  $3x/(2x^2-5x+2)$

If a train crosses a 600 m and a 200 m bridge in 80 seconds and 40 seconds respectively, then find the length of the train.

When a number is divided by 7, the remainder is 5. Find the remainder when the square of the same number is divided by 7.

Supriti and Suhana can complete a work together in 36 days. They began work together, but Supriti left after 12 days and consequently the work was finished in 45 days. Find time taken by Supriti to complete the work alone.



A shopkeeper suffers 7% loss when an article is sold at 90% of marked price. Find the profit/loss if the article is sold at the marked price.

Find the time period required to earn Rs 3328 interest on an amount of Rs 20000, if the rate of interest is 8% per annum compounded annually.

A train crosses a man and a 260 m long platform in 10 seconds and 20 seconds respectively. Find the length of the train.

Find the area of a triangle whose coordinates of the vertices are (1,0) , (1,-1) and (1,1).

The difference between the interior and exterior angles of a regular polygon is  $60^\circ$ . Find the number of sides of the polygon.

Find the 10th term of the sequence 2, 7, 12,.....

LCM and HCF of two numbers is 330 and 11. If one of the numbers is 55, then find the other.

A person travels half of the distance at 50 kmph and the remaining half at 40 kmph. Find the total distance travelled by him, if he completed the journey in 18 hours.

If at simple interest, a sum of money triples in 3 years, then find the time period in which the sum will become five times of itself.

Angles of elevation of the top of a tower from two points lying on the same side of the foot of the tower are  $45^\circ$  and  $30^\circ$ . Find the height of the tower.

If  $\cot^{-1}(-1/\sqrt{3}) = \alpha$ ; find the value of  $\alpha$ .

Which amount becomes Rs. 520 in 5 years and Rs. 568 in 7 years at a certain rate of Simple Interest?

If the cost price of 5 articles is equal to the selling price of 7 articles then find the profit/ loss percentage.

LCM and HCF of two numbers are 48 and 8 respectively. If one of the numbers is 24, find the other?

$\tan 1^\circ \cdot \tan 2^\circ \cdot \tan 3^\circ \dots \dots \dots \tan 89^\circ = ?$

A principal sum of Rs.8000 is lent at 10% interest rate p.a. for 1.5 years compounded half yearly. Find the C.I.

A+B can do a work in 27 days, B+C can do it in 18 days, while C+A can do it in 12 days. C alone can complete the same work in?

$a+b+c = 5$ ;  $ab+bc+ca = 10$ , find  $a^2+b^2+c^2 = \frac{2\sqrt{2} + 7}{2\sqrt{2} - 7} = x + y\sqrt{13}$

A does a piece of work in 20 days. He worked for 4 days and the remaining work is completed by B in 8 days. Find the time taken by A+B to complete the same work.

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