MATHS

BOOKS - PEARSON IIT JEE FOUNDATION

PROGRESSIONS

Example

---

1. In the series, $T_n = 2n + 5$, find S_4.

> ▶ **Watch Video Solution**

---

2. Find the 14 th term of an AP whose first term is 3 and the common difference is 2.

> ▶ **Watch Video Solution**

3. Find the first term and the common difference of an AP, if the 3rd term is 6 and 17 th term is 34.

4. Find the sum of the first 22 terms of an AP whose first term is 4 and the common difference is $\dfrac{4}{3}$.

    A. 396

    B. 390

    C. 456

    D. 100

Answer: A

5. Divide 124 into four parts in such a way that they are in AP and the product of the first and the 4 th part is 128 less than the product of the 2nd and the 3 rd parts.

6. Find the three terms in AP, whose sum is 36 and product is 960.

7. Find the sum of natural numbers and lying between 100 and 200 which leave a remainder of 2 when divided by 5 in each case.

A. 2990

B. 2847

C. 2936

D. None of these

8. Find the sum of 100 terms of the series $1(3) + 3(5) + 5(7) + \dots$

A. 1353300

B. 1353400

C. 135200

D. 1353100

Answer: A

9. Find the 7th term of the GP whose first term is 6 and common ratio is $\frac{2}{3}$.

10. Find the common ratio of the GP whose first and last terms are 25 and $\frac{1}{625}$ respectively and the sum of the GP is $\frac{19531}{625}$.

▶ Watch Video Solution

11. Find three numbers of a GP whose sum is 26 and product is 216.

▶ Watch Video Solution

12. If $|x| < 1$, then find the sum of the serires $2 + 4x + 6x^2 + 8x^3 + \ldots\ldots\ldots$

▶ Watch Video Solution

13. Find the sum of the series $1, \frac{2}{5}, \frac{4}{25}, \frac{8}{125}, \ldots \propto .$

▶ Watch Video Solution

14. S_{10} is the sum of first 10 terms of a GP and S_5 is the sum of the first 5 terms of the same GP. If $\dfrac{S_{10}}{S_5} = 244$, then find the common ratio.

A. 3

B. 4

C. 5

D. 2

Answer: A

▶ **Watch Video Solution**

---

15. The difference between two hundred-digit numbers consisting of all 1's and a hundred-digit number consisting of all 2's is equal to

A. $\underbrace{99...9}_{100 \ \text{times}}$

B. $\left(\dfrac{\underbrace{333...3}_{80 \ \text{times}}}{} \right)^2$

C. $\left(\dfrac{333...3}{100 \ \text{times}} \right)^2$

D. $\underbrace{99...9}_{200 \ \text{times}}$

Answer:

▶ **View Text Solution**

---

16. Find the 10 th term of the HP $\dfrac{3}{2}, 1, \dfrac{3}{4}, \dfrac{3}{5}, ...$

▶ **Watch Video Solution**

---

17. Insert three harmonic between $\dfrac{1}{12}$ and $\dfrac{1}{20}$.

▶ **Watch Video Solution**

---

18. The ratio of geometric and arithmetic mean of two real numbers is $3:5$. Then find the ratio of their harmonic mean and geometric mean.

A. $3:5$

B. $9:25$

C. $9:5$

D. $5:9$

Answer: A

▶ Watch Video Solution

1. Third term of the sequence whose nth term is $2n + 5$ is ___.

▶ Watch Video Solution

2. If a is the first term and d is the common difference of an AP, then the $(n + 1)$th term of the AP is ____.

▶ Watch Video Solution

3. If the sum of three consecutive terms of an AP is 9m, then the middle term is ___.

4. General term of the sequence $5, 25, 125, 625, \ldots$ is ___.

5. The arithmetic mean of 7 and 8 is ____.

6. The arrangement of numbers $\dfrac{1}{2}, \dfrac{-3}{4}, \dfrac{-5}{6}, \dfrac{-7}{8}, \ldots$ is an example of sequence. [True/False]

7. If $\dfrac{a}{2}$ is the first term and d is the common difference of an AP, then the sum of n terms of the AP is _____.

8. In a sequence, if S_n is the sum of n terms and S_{n-1} is the sum of $(n-1)$ terms, then the nth term is _____.

9. If $T_n = 3n + 8$, then $T_{n-1} =$ _____.

10. The sum of the first $(n + 1)$ natural number is ____.

11. For a series in geometric progression, the first term is a and the second term is 3a. The common ratio of the series is _____.

12. In a series, starting from the second term, if each term its previous term, then the series is in _____ progression.

13. All the multiples of 3 form a geometric progression. [True/False]

14. If a, b and c are in geometric progression then, a^2, b^2 and c^2 are in ____ progression.

15. If every term of a series in geometric progression is multiplied by a real number, then the resulting series also will be in geometric progression. [True/False]

16. Geometic mean of $5, 10$ and 20 is _____.

17. Sum of the infinite terms of the GP, $-3, -6, -12, \ldots$ is 3. [True/False]

18. The reciprocals of all the terms of a series in geometric progression form a _____ progression.

19. The nth term of the sequence $\dfrac{1}{100}, \dfrac{1}{10000}, \dfrac{1}{1000000}, \ldots$ is _____.

20. Ina series, $T_n = x^{2n-2}(x \neq 0)$, then write the infinite series.

21. The harmonic mean of $1, 2$ and 3 is $\dfrac{3}{2}$. [True/False]

22. If a, b, c and d are in harmonic progression, then $\dfrac{1}{a}, \dfrac{1}{b}, \dfrac{1}{c}$ and $\dfrac{1}{d}$ are in _____ progression.

23. If the AM of two numbers is 9 and their HM is 4, then their GM is 6. [True/False]

24. If a, b and c are the arithmetic mean, geometric mean and harmonic mean of two distinct terms respectively, then b^2 is equal to _____.

25. If the sum of first n terms which are in GP is $a(r+1)$, then the number of terms is _____. (Where a is the first term and r is the common

ratio)

26. Write the first three terms of the sequence whose nth term is $T_n = 8 - 5n$.

27. Write the first three terms of the sequence whose nth term is $T_n = 5^{n+1}$

28. If three arithemetic means are inserted between 4 and 5, then the commom difference is _____.

29. If the 7 th and the 9 th terms of a GP are x and y respectively, then the common ratio of the GP is _____.

> ▶ Watch Video Solution

30. In a series, $T_n = 3 - n$, then $S_5 =$ _____.

> ▶ Watch Video Solution

Short Answer Type Questions

1. If the 5th term and the 14 th term of an AP are 35 and 8 respectively, then find the 20 th term of the AP.

> ▶ Watch Video Solution

2. Which term of the series $21, 15, 9, \ldots$ is -39 ?

3. If the seventh term of an AP is 25 and the common difference is 4, then find the 15 th term of AP.

4. Find the general term of AP whose sum of n terms is given by $4n^2 + 3n$

.

5. Find the sum of all three-digit numbers which leave a remainder 2, when divided by 6.

6. If the ratio fo the sum of first three terms of a GP to the sum of first six terms is $448 : 455$, then find the common ratio.

▶ Watch Video Solution

7. If in a GP, 5th term and the 12th term are 9 and $\dfrac{1}{243}$ respectively, find the 9th term of GP.

▶ Watch Video Solution

8. A person opens an account with ₹ 50 and starts depositing every day double the amount he has deposited on the previous day. Then find the amount he has deposited on the 10 th day from the beginning.

▶ Watch Video Solution

9. Find the sum of 5 geometric means between $\dfrac{1}{3}$ and 243, by taking common ratio positive.

10. Using progressions express the recurring decimal $2 \cdot \overline{123}$ in the form of $\dfrac{p}{q}$, where p and q are integers.

11. A ball is dropped from a height of 64 m and it rebounces $\dfrac{3}{4}$ of the distance evey time it touches the ground. Find the total distance it travels before it comes to rest.

12. Find the sum to n terms of the series $5 + 55 + 555 + \ldots$

13. In an HP, if the 3 rd term and the 12 th term are 12 and 3 respectively, then find the 15 th term of the HP.

▶ **Watch Video Solution**

14. If lth, mth and nth terms of an HP are x, y and z respectively, then find the value of $yz(m - n) + xz(n - 1) + xy(l - m)$.

▶ **Watch Video Solution**

15. The AM of two numbers is 40 more than GM and 64 more than HM. Find the numbers.

▶ **Watch Video Solution**

Essay Type Questions

1. Find the sum to n terms of the series

$1 \cdot 2 \cdot 3 + 2 \cdot 4 \cdot 6 + 3 \cdot 6 \cdot 9 + \ldots$

2. One side of an equilateral triangle is 36 cm. The mid-points of its sides are joined to form another triangle. Again another triangle is formed by joining the mid-points of the sides of this triangle and the process is continued indefinitely. Determine the sum of areas of all such triangles including the given triangle.

3. Three positive numbers form a GP. If the middle number is increased by 8, the three numbers form an AP. If the last number is also increased by 64 along with the previous increase in the middle number, the resulting numbers form a GP again.Then :-

4. Let A;G;H be the arithmetic; geometric and harmonic means of two positive no. a and b then $A \geq G \geq H$

5. The product of three numbers of a GP is $\dfrac{64}{27}$. If the sum of their products when taken in pairs is $\dfrac{148}{27}$, then find the numbers.

Level 1

1. Find t_5 and t_6 of the arithmetic progression $0, \dfrac{1}{4}, \dfrac{1}{2}, \dfrac{3}{4}, \ldots$.

A. $1, \dfrac{5}{4}$

B. $\dfrac{5}{4}, 1$

C. $1, \dfrac{7}{4}$

D. $\dfrac{7}{4}, 1$

Answer: A

▶ Watch Video Solution

---

2. If $t_n = 6n + 5$, then t_{n+1} =_____.

A. $6n - 1$

B. $6n + 11$

C. $6n + 6$

D. $6n - 5$

Answer: B

▶ Watch Video Solution

3. Which term of the arithmetic progression 21, 42, 63, 84, . . . is 420 ?

A. 19

B. 20

C. 21

D. 22

Answer: B

> ▶ **Watch Video Solution**

4. Find the 15th term of the arithmetic progression 10, 4, -2, ...

A. $-721 =$

B. -74

C. -76

D. -78

Answer: B

---

5. If the kth term of the arithmetic progression $25, 50, 75, 100, \ldots$ is 1000, then k is _____.

A. 20

B. 30

C. 40

D. 50

Answer: C

---

6. The sum of the first 20 terms of an arithmetic progression whose first term is 5 and common difference is 4, is _____.

A. 820

B. 830

C. 850

D. 860

Answer: D

▶ Watch Video Solution

7. Two arithmetic progressions have equal common differences. The first term of one of these is 3 and that of the other is 8, then the difference between their 100 th terms is _____.

A. 4

B. 5

C. 6

D. 3

Answer: B

---

8. If a, b and c are in arithmetic progression, then $b + c, c + a$ and $a + b$ are in

A. arithmetic progression

B. geometric progression

C. harmonic progression

D. None of these

Answer: A

---

9. The sum of the first 51 terms of the arithmetic progression whose 2nd term is 2 and 4th term is 8, is _____.

A. 3774

B. 3477

C. 7548

D. 7458

Answer: A

▶ **Watch Video Solution**

10. Three alternate terms of an arithmetic progression are

$x + y, x - y$ and $2x + 3y,$ then $x =$ _____.

A. $-y$

B. $-2y$

C. $-4y$

D. $-6y$

Answer: D

11. Find the 15th term of the series $243, 81, 27, \ldots$

A. $\dfrac{1}{3^{14}}$

B. $\dfrac{1}{3^{8}}$

C. $\left(\dfrac{1}{3}\right)^{9}$

D. $\left(\dfrac{1}{3}\right)^{10}$

Answer: C

12. If t_8 and t_3 of a geometric progression are $\dfrac{4}{9}$ and $\dfrac{27}{8}$ respectively, then find t_{12} of the geometric progression.

A. $\dfrac{64}{729}$

B. $\dfrac{32}{243}$

C. $\dfrac{729}{64}$

D. $\dfrac{243}{32}$

Answer: A

> ▶ Watch Video Solution

---

13. If $t_n = 3^{n+1}$, then $S_6 - S_5 =$ _____.

A. 243

B. 81

C. 77

D. 27

Answer: A

> ▶ Watch Video Solution

14. Find the sum of the first 10 terms of geometric progression 18, 9, 4.5, . . .

A. $9\dfrac{\left(2^{10} - 1\right)}{2^8}$

B. $9\dfrac{\left(2^{10} - 1\right)}{2^{10}}$

C. $36\left(\dfrac{2^{10} - 1}{2^8}\right)$

D. $8\dfrac{\left(2^{10} - 1\right)}{2^8}$

Answer: A

▶ **Watch Video Solution**

---

15. If the 3rd, 7th and 11th terms of a geometric progression are p, q and r respectively, then the relation among p, q and r is ____.

A. $p^2 = qr$

B. $r^2 = qp$

C. $q^2 = p^2 r^2$

D. $q^2 = pr$

Answer: D

---

16. Evaluate $\sum (3 + 2^r)$, where $r = 1, 2, 3, \ldots, 10.$

A. 2051

B. 2049

C. 2076

D. 1052

Answer: C

---

17. Find the sum of the series $\dfrac{27}{8} + \dfrac{9}{4} + \dfrac{3}{2} + \ldots\infty$

A. $\dfrac{81}{8}$

B. $\dfrac{27}{8}$

C. $\dfrac{81}{16}$

D. $\dfrac{9}{8}$

Answer: A

▶ **Watch Video Solution**

18. If $3x - 4$, $x + 4$ and $5x + 8$ are the three positive consecutive terms

of a geometric progression, then find the terms.

A. 2, 8, 32

B. 2, 10, 50

C. 2, 6, 18

D. 12, 6, 3

Answer: C

19. Find the geometric mean of the first twenty five powers of twenty five.

A. 5^{13}

B. 5^{19}

C. 5^{24}

D. 5^{26}

Answer: D

20. Find the sum of 3 geometric means between $\dfrac{1}{3}$ and $\dfrac{1}{48}(r > 0)$.

A. $\dfrac{1}{4}$

B. $\dfrac{5}{24}$

C. $\dfrac{7}{24}$

D. $\dfrac{1}{3}$

Answer: C

21. If the second and the seventh terms of a Harmonic Progression are $\dfrac{1}{5}$ and $\dfrac{1}{25}$, then find the series.

A. $1, \dfrac{1}{5}, \dfrac{1}{9}, \ldots$

B. $\dfrac{1}{2}, \dfrac{1}{5}, \dfrac{1}{8}, \ldots$

C. $\dfrac{1}{7}, \dfrac{1}{5}, \dfrac{1}{3}, \ldots$

D. $\dfrac{1}{3}, \dfrac{1}{5}, \dfrac{1}{7}, \ldots$

Answer: A

22. The 10th term of harmonic progression $\dfrac{1}{5}, \dfrac{4}{19}, \dfrac{2}{9}, \dfrac{4}{17}, \ldots$ is _____.

A. $\dfrac{11}{4}$

B. $\dfrac{13}{4}$

C. $\dfrac{4}{13}$

D. $\dfrac{4}{11}$

Answer: D

▶ Watch Video Solution

---

23. If the ratio of the arithmatic mean and the geometric mean of two positive numbers is $3:2$, then find the ratio of the geometric mean and the harmonic mean of the numbers.

A. $2:3$

B. $9:4$

C. $3:2$

D. $4:9$

---

24. If A, G and H are AM, GM and HM of any two given positive numbers, then find the relation between A, G and H.

A. $A^2 = GH$

B. $G^2 = AH$

C. $H^2 = AG$

D. $G^3 = A^2 H$

25. Find the least value of n for which th sum $1 + 2 + 2^2 + \ldots$ to n terms is greater than 3000.

A. 8

B. 10

C. 12

D. 15

Answer: C

▶ **Watch Video Solution**

---

26. Find the HM of $\dfrac{1}{7}$ and $\dfrac{1}{12}$.
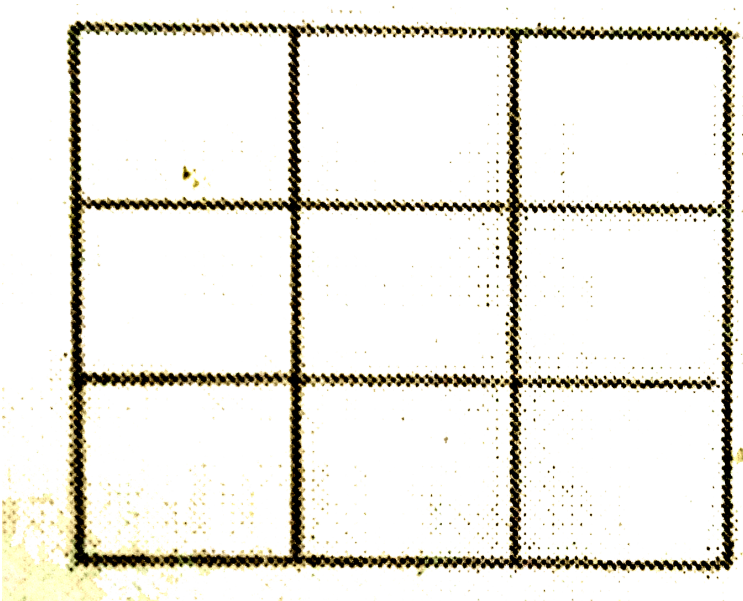
A. $\dfrac{1}{19}$

B. $\dfrac{2}{19}$

C. $\dfrac{3}{19}$

D. $\dfrac{4}{19}$

Answer: B

27. Number of rectangles in the following figure is ___.

A. 9

B. 10

C. 24

D. 36

Answer: D

---

28. In a series, if $t_n = \dfrac{n^2 - 1}{n + 1}$, then $S_6 - S_3 = $ _____.

A. 3

B. 12

C. 22

D. 25

Answer: B

---

29. Find the number of terms to be added in the series $27, 9, 3, \ldots$ so that the sum is $\dfrac{1093}{27}$.

A. 6

B. 7

C. 8

D. 9

Answer: B

▶ **Watch Video Solution**

---

30. Find the value of $p(p > 0)$ if $\dfrac{15}{4} + p$, $\dfrac{5}{2} + 2p$ and $2 + p$ are the three consecutive terms of a geometric progression.

A. $\dfrac{3}{4}$

B. $\dfrac{1}{4}$

C. $\dfrac{5}{3}$

D. $\dfrac{1}{2}$

Answer: B

1. If $\dfrac{1}{b+c}$, $\dfrac{1}{c+a}$ and $\dfrac{1}{a+b}$ are in AP, then a^2, b^2 and c^2 are in

    A. geometric progression

    B. arithmetic progression

    C. harmonic progression

    D. None of these

Answer: B

2. Among the following, which term belongs to the arithmetic progression $-5, 2, 9, \ldots$?

A. 342

B. 343

C. 344

D. 345

Answer: D

▶ **Watch Video Solution**

3. Five distinct positive integers are in arithmetic progressions with a positive common difference. If their sum is 10020, then find the smaller possible value of the last term.

A. 2002

B. 2004

C. 2006

D. 2007

Answer: C

4. In a right triangle, the lengths of the sides are in arithmetic progression. If the lengths of the sides of the triangle are integers, which of the following could be the length of the shortest side ?

A. 2125

B. 1700

C. 1275

D. 1150

Answer: C

5. If $S_1 = 3, 7, 1115, \ldots$ upto 125 terms and $S_2 = 4, 7, 10, 13, 16, \ldots$ upto 125 terms the how many terms are there in S_1 that are there in S_2 ?

A. 29

B. 30

C. 31

D. 32

Answer: C

▶ **Watch Video Solution**

6. The first term and the mth term of a geometric progression are a and n respectively and its nth term is m. Then its $(m + 1 - n)$th term is _____.

A. $\dfrac{ma}{n}$

B. $\dfrac{na}{m}$

C. mna

D. $\dfrac{mn}{a}$

Answer: B

---

7. The sum of the terms of an infinite geometric progression is 3 and the sum of the squares of the terms is 81. Find the first term of the series.

A. 5

B. $\dfrac{27}{5}$

C. $\dfrac{31}{6}$

D. $\dfrac{19}{3}$

Answer: B

8. If $\log_{\sqrt{2}} x + \log_{\sqrt{\sqrt{2}}} x + \log_{\sqrt{\sqrt{\sqrt{2}}}} x + \ldots$ upto 7 terms = 1016, the find

the value of x.

A. 4

B. 16

C. 64

D. 2

Answer: B

▶ **Watch Video Solution**

9. For which of the following values of x is

$8^{1+\sin x + \sin^2 x + \sin^3 x + \ldots + \infty} = 64$?

A. $60°$

B. $135°$

C. $45°$

D. $30°$

Answer: D

10. Find the sum of all the multiples of 6 between 200 and 1100.

A. 96750

B. 95760

C. 97560

D. 97650

Answer: D

11. If the kth term of a HP is λp and the λth term is kp and $k \neq \lambda$, then the p th term is _____.

A. $k^2\lambda$

B. k^2p

C. p^2k

D. λk

Answer: D

▶ Watch Video Solution

12. If six harmonic means are inserted between 3 and $\dfrac{6}{23}$, then the fourth harmonic mean is

A. $\dfrac{6}{11}$

B. $\dfrac{6}{17}$

C. $\dfrac{3}{7}$

D. $\dfrac{3}{10}$

Answer: C

13. If a, b and c are positive numbers in arithmetic progression and a^2, b^2 and c^2 are in geometric progression, then a^3, b^3 and c^3 are in

(A) arithmetic progression.

(B) geometric progression.

(C) harmonic progression.

    A. (A) and (B) only

    B. only (C)

    C. (A), (B) and (C)

    D. only (B)

Answer: C

14. The arithmetic mean A of two positive numbers is 8. The harmonic mean H and the geometric mean G of the numbers satisfy the relation $4H + G^2 = 90$. Then one of two numbers is ____.

A. 6

B. 8

C. 12

D. 14

Answer: A

> ▶ **Watch Video Solution**

15. The infinite sum $\sum_{n=1}^{\infty} \left(\dfrac{5^n + 3^n}{5^n} \right)$ is equal to

A. $\dfrac{3}{2}$

16. (i) If $x = 3 + \dfrac{3}{y} + \dfrac{3}{y^2} + \dfrac{3}{y^3} + \ldots + \infty$, then, show that $y = \dfrac{x}{x-3}$.

(Where $|y| < 1$). The following are the steps involv4ed in solving the above problem. Arrange them in sequential order.

(A) $xy - 3y = x$

(B) $x = 3\left(\dfrac{1}{1 - \frac{1}{y}}\right)$

(C) $y(x - 3) = x$

(D) $x = 3\left(\dfrac{y}{y - 1}\right)$

A. BDCA

B. BDAC

C. CABD

D. ACBD

17. Find the harmonic mean of 5 and 3.

The following are the steps involved in solving he above problem. Arrange them in sequenctial order.

(A) HM = $\dfrac{2 \times 5 \times 3}{5 + 3}$

(B) We know that the harmonic mean of a, b is $\dfrac{2ab}{a + b}$.

(C) Here, $a = 5 \text{ and } b = 3.$

(D) HM = $\dfrac{30}{8} = \dfrac{15}{4}$

A. BCDA

B. BCAD

C. ABCD

D. BADC

Answer: B

Level 3

1. The numbers $h_1, h_2, h_3, h_4, \ldots, h_{10}$ are in harmonicprogression and $a_1, a_2, \ldots, a_{10}$ are in arithmetic progression. If $a_1 = h_1 = 3$ and $a_7 = h_7 = 39$, thenthe value of $a_4 \times h_4$ is

A. $\dfrac{13}{49}$

B. $\dfrac{182}{3}$

C. $\dfrac{7}{13}$

D. 117

Answer: D

2. Find the value of

$$\left(1 + \frac{1}{2}\right)\left(1 + \frac{1}{4}\right)\left(1 + \frac{1}{16}\right)\left(1 + \frac{1}{156}\right)\ldots\infty.$$

A. 1

B. 2

C. $\dfrac{1}{3}$

D. $\dfrac{1}{4}$

Answer: B

3. The ratio of the sum of n terms of two arithmetic progressions is given by $(2n + 3) : (5n - 7)$. Find the ratio of their nth terms.

A. $(4n + 5) : (10n' + 2)$

B. $(4n + 1) : (10n' - 12)$

C. $(4n - 1) : (10n' + 8)$

D. $(4n - 5) : (10n' - 2)$

Answer: B

▶ **Watch Video Solution**

---

4. There are n arithmetic means (were $n \in N$) between 11 and 53 such that each of them is an integer. How many distinct arithmetic progressions are prossible from the above data ?

A. 7

B. 8

C. 14

D. 16

Answer: C

5. If $x = \dfrac{1}{\sqrt{2}} + \dfrac{1}{2} + \dfrac{1}{2\sqrt{2}} + \ldots + \infty$, then find the value of $x + \dfrac{1}{x}$.

A. $\sqrt{2}$

B. $2\sqrt{2}$

C. $3\sqrt{2}$

D. $4\sqrt{2}$

Answer: B

6. In a GP of 6 terms, the first and last terms are $\dfrac{x^3}{y^2}$ and $\dfrac{y^3}{x^2}$ respectively. Find the ratio of 3rd and 4th terms of that GP.

A. $x^2 : 1$

B. $y^2 : x$

C. $y : x$

D. $x : y$

Answer: D

> ▶ **Watch Video Solution**

---

7. If $x = 3 + \dfrac{3}{y} + \dfrac{3}{y^2} + \dfrac{3}{y^3} + \ldots + \infty$, then $y=$ _____.

A. $\dfrac{x}{3}$

B. $\dfrac{x}{x - 3}$

C. $\dfrac{1 - x}{3}$

D. $1 - \dfrac{3}{x}$

Answer: B

> ▶ **Watch Video Solution**

8. Find the sum of $\dfrac{0.3}{0.5} + \dfrac{0.33}{0.55} + \dfrac{0.333}{0.555} + \dots$ to 15 terms.

A. 10

B. 9

C. 3

D. 5

Answer: B

▶ **Watch Video Solution**

---

9. In a GP, if the fourth terms is the square of the second term, then the relation between the first term and common ratio is ____.

A. $a = r$

B. $a = 2r$

C. $2a = r$

D. $r^2 = a$

Answer: A

---

10. For which of the following values of x is $(0° < x < 90°)16^{1 + \cos x + \cos^2 x + \cos^3 x + \dots \infty} = 256$?

A. $30°$

B. $45°$

C. $60°$

D. $15°$

Answer: C

---

11. If t_2 and t_3 of a GP are p and q, respectively, then $t_5 = $ _____.

A. $p\left(\dfrac{q}{p}\right)^3$

B. $p\left(\dfrac{q}{p}\right)^2$

C. $\dfrac{p^2}{q^3}$

D. $p^2 q^2$

Answer: A

▶ **Watch Video Solution**

---

12. If a, b, c, d are in GP, then $(b+c)^2 = $ _____.

A. $(b+d)(a+d)$

B. $(a+d)(c+d)$

C. $(a+b)(c+d)$

D. $(a+c)(b+d)$

Answer: C

▶ **Watch Video Solution**

13. a, b, c are in GP. If a is the first term and c is the common ratio, then $b=$

_____.

A. 1

B. $\dfrac{1}{a}$

C. $\dfrac{1}{c}$

D. None of these

Answer: A

▶ Watch Video Solution

14. In a GP of 7 terms, the last term is $\dfrac{64}{81}$ and the common ratio is $\dfrac{2}{3}$.

Find the 3rth term.

A. 4

B. 9

C. 8

D. 12

Answer: A

▶ **Watch Video Solution**

15. An AP starts with a positive fraction and every alternate term is an integer. If the sum of the first 11 terms is 33, then find the fourth term.

A. 2

B. 3

C. 5

D. 6

Answer: A

▶ **Watch Video Solution**

16. If the sum of 16 terms of an AP is 1624 and the first term is 500 times the common difference, then find the common difference.

A. 5

B. $\dfrac{1}{2}$

C. $\dfrac{1}{5}$

D. 2

Answer: C

▶ Watch Video Solution

---

17. Find the sum of the series

$$1 + (1 + 2) + (1 + 2 + 3) + (1 + 2 + 3 + 4) + \ldots + (1 + 2 + 3 + \ldots + 20$$

.

A. 1470

B. 1540

C. 1610

D. 1370

Answer: B

▶ **Watch Video Solution**

18. Evaluate $\sum 2^i$, where $i = 2, 3, 4, \ldots, 10.$

A. 2044

B. 2048

C. 1024

D. 1022

Answer: A

▶ **Watch Video Solution**