CAT 2017 Slot 1 – Quantitative Ability

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CAT 2017 Slot 1 – Quantitative Ability

Number of Questions: 34

Duration: 1 Hr

Section Marks: 34*3 = 102 Marks

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34						

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Qn 1

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Arun's present age in years is 40% of Barun's. In another few years, Arun's age will be half of Barun's. By what percentage will Barun's age increase during this period?

(TITA)

Click to see the correct answer

Answer

Click to view video Solution
for this question

Video Solution

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Original CAT 2017 Question Paper

Qn 2

A person can complete a job in 120 days. He works alone on Day 1. On Day 2, he is joined by another person who also can complete the job in exactly 120 days. On Day 3, they are joined by another person of equal efficiency. Like this, everyday a new person with the same efficiency joins the work. How many days are required to complete the job?

(TITA)

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Answer

Video Solution

Qn 3

An elevator has a weight limit of 630 kg. It is carrying a group of people of whom the heaviest weighs 57 kg and the lightest weighs 53 kg. What is the maximum possible number of people in the group?

(TITA)

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Answer

Video Solution

Qn 4

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A man leaves his home and walks at a speed of 12 km per hour, reaching the railway station 10 minutes after the train had departed. If instead he had walked at a speed of 15 km per hour, he would have reached the station 10 minutes before the train's departure. The distance (in km) from his home to the railway station is:

(TITA)

Click to see the correct answer

Answer

Click to view video Solution
for this question

Video Solution

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Qn 5

Ravi invests 50% of his monthly savings in fixed deposits. Thirty percent of the rest of his savings is invested in stocks and the rest goes into Ravi's savings bank account. If the total amount deposited by him in the bank (for savings account and fixed deposits) is Rs 59500, then Ravi's total monthly savings (in Rs) is:

(TITA)

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Answer

Video Solution

Qn 6

If a seller gives a discount of 15% on retail price, she still makes a profit of 2%. Which of the following ensures that she makes a profit of 20%?

A) Give a discount of 5% on retail price

B) Give a discount of 2% on retail price

C) Increase the retail price by 2%

D) Sell at retail price

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Answer

Video Solution

Qn 7

A man travels by a motor boat down a river to his office and back. With the speed of the river unchanged, if he doubles the speed of his motor boat, then his total travel time gets reduced by 75%. The ratio of the original speed of the motor boat to the speed of the river is:

A) $\sqrt{6}:\sqrt{2}$

B) $\sqrt{7}: 2$

C) $2\sqrt{5}:3$

D) 3:2

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Answer

Video Solution

Qn 8

Suppose, C1, C2, C3, C4, and C5 are five companies. The profits made by C1, C2, and C3 are in the ratio 9 : 10 : 8 while the profits made by C2, C4, and C5 are in the ratio 18 : 19 : 20. If C5 has made a profit of Rs 19 crore more than C1, then the total profit (in Rs) made by all five companies is:

A) 438 crore

B) 435 crore

C) 348 crore

D) 345 crore

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Answer

Video Solution

Qn 9

The number of girls appearing for an admission test is twice the number of boys. If 30% of the girls and 45% of the boys get admission, the percentage of candidates who do not get admission is:

A) 35

B) 50

C) 60

D) 65

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Answer

Video Solution

Qn 10

A stall sells popcorn and chips in packets of three sizes: large, super, and jumbo. The numbers of large, super, and jumbo packets in its stock are in the ratio 7 : 17 : 16 for popcorn and 6 : 15 : 14 for chips. If the total number of popcorn packets in its stock is the same as that of chips packets, then the numbers of jumbo popcorn packets and jumbo chips packets are in the ratio:

A) 1: 1

B) 8: 7

C) 4: 3

D) 6: 5

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Answer

Video Solution

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Qn 11

In a market, the price of medium quality mangoes is half that of good mangoes. A shopkeeper buys 80 kg good mangoes and 40 kg medium quality mangoes from the market and then sells all these at a common price which is 10% less than the price at which he bought the good ones. His overall profit is:

A) 6%

B) 8%

C) 10%

D) 12%

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Answer

Video Solution

Qn 12

If Fatima sells 60 identical toys at a 40% discount on the printed price, then she makes 20% profit. Ten of these toys are destroyed in fire. While selling the rest, how much discount should be given on the printed price so that she can make the same amount of profit?

A) 30%

B) 25%

C) 24%

D) 28%

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Answer

Video Solution

Qn 13

If a and b are integers of opposite signs such that $(a + 3)^2 : b^2 = 9 : 1$ and $(a - 1)^2 : (b - 1)^2 = 4 : 1$, then the ratio $a^2 : b^2$ is:

A) 9:4

B) 81:4

C) 1:4

D) 25:4

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Answer

Video Solution

Qn 14

A class consists of 20 boys and 30 girls. In the mid-semester examination, the average score of the girls was 5 higher than that of the boys. In the final exam, however, the average score of the girls dropped by 3 while the average score of the entire class increased by 2. The increase in the average score of the boys is:

A) 9.5

B) 10

C) 4.5

D) 6

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Answer

Video Solution

Qn 15

The area of the closed region bounded by the equation | x | + | y | = 2 in the two-dimensional plane is

A) 4π

B) 4

C) 8

D) 2π

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Answer

Video Solution

Qn 16

From a triangle ABC with sides of lengths 40 ft, 25 ft and 35 ft, a triangular portion GBC is cut off where G is the centroid of ABC. The area, in sq ft, of the remaining portion of triangle ABC is:

A) $225\sqrt{3}$

B) $\frac{500}{\sqrt{3}}$

C) $\frac{275}{\sqrt{3}}$

D) $\frac{250}{\sqrt{3}}$

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Answer

Video Solution

Qn 17

Let ABC be a right-angled isosceles triangle with hypotenuse BC. Let BQC be a semi-circle, away from A, with diameter BC. Let BPC be an arc of a circle centered at A and lying between BC and BQC. If AB has length 6 cm then the area, in sq. cm, of the region enclosed by BPC and BQC is:

A) $9\pi - 18$

B) 18

C) 9π

D) 9

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Answer

Video Solution

Qn 18

A solid metallic cube is melted to form five solid cubes whose volumes are in the ratio 1 : 1 : 8: 27: 27. The percentage by which the sum of the surface areas of these five cubes exceeds the surface area of the original cube is nearest to:

A) 10

B) 50

C) 60

D) 20

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Answer

Video Solution

Qn 19

A ball of diameter 4 cm is kept on top of a hollow cylinder standing vertically. The height of the cylinder is 3 cm, while its volume is 9 π cm^3. Then the vertical distance, in cm, of the topmost point of the ball from the base of the cylinder is:

(TITA)

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Answer

Video Solution

Qn 20

Let ABC be a right-angled triangle with BC as the hypotenuse. Lengths of AB and AC are 15 km and 20 km, respectively. The minimum possible time, in minutes, required to reach the hypotenuse from A at a speed of 30 km per hour is:

(TITA)

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Answer

Video Solution

Qn 21

Suppose, $\log_3 x = \log_{12} y = a$, where x, y are positive numbers. If G is the geometric mean of x and y, and $\log_6 G$ is equal to:

A) $\sqrt{a}$

B) 2a

C) $\frac{a}{2}$

D) a

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Answer

Video Solution

Qn 22

If $x + 1 = x^2$ and $x > 0$, then $2x^4$ is:

A) $6 + 4\sqrt{5}$

B) $3 + 5\sqrt{5}$

C) $5 + 3\sqrt{5}$

D) $7 + 3\sqrt{5}$

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Answer

Video Solution

Qn 23

The value of $\log_{0.008}\sqrt{5} + \log_{\sqrt{3}} 81 - 7$ is equal to:

A) $\frac{1}{3}$

B) $\frac{2}{3}$

C) $\frac{5}{6}$

D) $\frac{7}{6}$

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Qn 24

If $9^{2x-1} - 81^{x-1} = 1944$, then x is

A) 3

B) $\frac{9}{4}$

C) $\frac{4}{9}$

D) $\frac{1}{3}$

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Answer

Video Solution

Qn 25

The number of solutions (x, y, z) to the equation $x - y - z = 25$, where x, y, and z are positive integers such that $x \leq 40$, $y \leq 12$, and $z \leq 12$ is

A) 101

B) 99

C) 87

D) 105

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Answer

Video Solution

Qn 26

For how many integers n, will the inequality $(n - 5)(n - 10) - 3(n - 2) \leq 0$ be satisfied?

(TITA)

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Answer

Video Solution

Qn 27

If $f_1(x) = x^2 + 11x + n$ and $f_2(x) = x$, then the largest positive integer n for which the equation $f_1(x) = f_2(x)$ has two distinct real roots, is:

(TITA)

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Answer

Video Solution

Qn 28

If a, b, c, and d are integers such that a + b + c + d = 30, then the minimum possible value of $(a - b)^2 + (a - c)^2 + (a - d)^2$ is

(TITA)

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Answer

Video Solution

Qn 29

Let AB, CD, EF, GH, and JK be five diameters of a circle with center at O. In how many ways can three points be chosen out of A, B, C, D, E, F, G, *H*, J, K, and O so as to form a triangle?

(TITA)

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Answer

Video Solution

Qn 30

The shortest distance of the point $(\frac{1}{2},1)$ from the curve $y = |x - 1| + |x + 1|$ is

A) 1

B) 0

C) $\sqrt{2}$

D) $\sqrt{\frac{3}{2}}$

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Answer

Video Solution

Qn 31

If the square of the 7th term of an arithmetic progression with positive common difference equals the product of the 3rd and 17th terms, then the ratio of the first term to the common difference is:

A) 2: 3

B) 3 : 2

C) 3: 4

D) 4: 3

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Answer

Video Solution

Qn 32

In how many ways can 7 identical erasers be distributed among 4 kids in such a way that each kid gets at least one eraser but nobody gets more than 3 erasers?

A) 16

B) 20

C) 14

D) 15

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Qn 33

If f(x)= $\frac{5x+2}{3x-5}$ and g(x) = $x^2 - 2x - 1$, then the value of g(f(f(3))) is:

A) 2

B) $\frac{1}{3}$

C) 6

D) $\frac{2}{3}$

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Answer

Video Solution

Qn 34

Let $a_1, a_2, \ldots\ldots a_{3n}$ be an arithmetic progression with $a_1 = 3$ and $a_2 = 7$. If $a_1 + a_2 + \ldots + a_{3n} = 1830$, then what is the smallest positive integer m such that $m(a_1 + a_2 + \ldots + a_n) > 1830$?

A) 8

B) 9

C) 10

D) 11

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Answer

Video Solution

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Solution

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1) 20
2) 15
3) 11
4) 20
5) 7000
6) D
7) B
8) A
9) D
10) A
11) B
12) D
13) D
14) A
15) C
16) B
17) B
18) B
19) 6
20) 24
21) D
22) D
23) C
24) B
25) B
26) 11
27) 24
28) 2
29) 160
30) A
31) A
32) A
33) A
34) B

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Arun's present age in years is 40% of Barun's. In another few years, Arun's age will be half of Barun's. By what percentage will Barun's age increase during this period?

(TITA)

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Back to Question

Answer: **20**

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Difficulty Level – Easy

Topic – Percentages

Video Solution

Sol 2

A person can complete a job in 120 days. He works alone on Day 1. On Day 2, he is joined by another person who also can complete the job in exactly 120 days. On Day 3, they are joined by another person of equal efficiency. Like this, everyday a new person with the same efficiency joins the work. How many days are required to complete the job?

(TITA)

Answer: **15**

Difficulty Level – Easy

Topic – Pipes and Cisterns

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Video Solution

Sol 3

An elevator has a weight limit of 630 kg. It is carrying a group of people of whom the heaviest weighs 57 kg and the lightest weighs 53 kg. What is the maximum possible number of people in the group?

(TITA)

Answer: **11**

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Difficulty Level – Medium

Topic – Averages

Back to Question

Video Solution

Sol 4

A man leaves his home and walks at a speed of 12 km per hour, reaching the railway station 10 minutes after the train had departed. If instead he had walked at a speed of 15 km per hour, he would have reached the station 10 minutes before the train's departure. The distance (in km) from his home to the railway station is:

(TITA)

Answer: **20**

Difficulty Level – Easy

Topic – Speed, Time and Distance

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Video Solution

Sol 5

Ravi invests 50% of his monthly savings in fixed deposits. Thirty percent of the rest of his savings is invested in stocks and the rest goes into Ravi's savings bank account. If the total amount deposited by him in the bank (for savings account and fixed deposits) is Rs 59500, then Ravi's total monthly savings (in Rs) is:

(TITA)

Answer: **70000**

Difficulty Level – Easy

Topic – Percentages

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Back to Question

Video Solution

Sol 6

If a seller gives a discount of 15% on retail price, she still makes a profit of 2%. Which of the following ensures that she makes a profit of 20%?

A) Give a discount of 5% on retail price

B) Give a discount of 2% on retail price

C) Increase the retail price by 2%

D) Sell at retail price

Difficulty Level – Easy

Topic – Profit and Loss

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Back to Question

Video Solution

Sol 7

A man travels by a motor boat down a river to his office and back. With the speed of the river unchanged, if he doubles the speed of his motor boat, then his total travel time gets reduced by 75%. The ratio of the original speed of the motor boat to the speed of the river is:

A) $\sqrt{6}:\sqrt{2}$

B) $\sqrt{7}: 2$

C) $2\sqrt{5}:3$

D) 3:2

Difficulty Level – Hard

Topic – Speed, Time and Distance

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Back to Question

Video Solution

Sol 8

Suppose, C1, C2, C3, C4, and C5 are five companies. The profits made by C1, C2, and C3 are in the ratio 9 : 10 : 8 while the profits made by C2, C4, and C5 are in the ratio 18 : 19 : 20. If C5 has made a profit of Rs 19 crore more than C1, then the total profit (in Rs) made by all five companies is:

A) 438 crore

B) 435 crore

C) 348 crore

D) 345 crore

Difficulty Level – Medium

Topic – Ratio and Proportions

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Back to Question

Video Solution

Sol 9

The number of girls appearing for an admission test is twice the number of boys. If 30% of the girls and 45% of the boys get admission, the percentage of candidates who do not get admission is:

A) 35

B) 50

C) 60

D) 65

Difficulty Level – Easy

Topic – Percentages

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Video Solution

Sol 10

A stall sells popcorn and chips in packets of three sizes: large, super, and jumbo. The numbers of large, super, and jumbo packets in its stock are in the ratio 7 : 17 : 16 for popcorn and 6 : 15 : 14 for chips. If the total number of popcorn packets in its stock is the same as that of chips packets, then the numbers of jumbo popcorn packets and jumbo chips packets are in the ratio:

A) 1: 1

B) 8: 7

C) 4: 3

D) 6: 5

Difficulty Level – Medium

Topic – Ratio and Proportions

Back to Question

Video Solution

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Sol 11

In a market, the price of medium quality mangoes is half that of good mangoes. A shopkeeper buys 80 kg good mangoes and 40 kg medium quality mangoes from the market and then sells all these at a common price which is 10% less than the price at which he bought the good ones. His overall profit is:

A) 6%

B) 8%

C) 10%

D) 12%

Difficulty Level – Medium

Topic – Profit and Loss

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Back to Question

Video Solution

Sol 12

If Fatima sells 60 identical toys at a 40% discount on the printed price, then she makes 20% profit. Ten of these toys are destroyed in fire. While selling the rest, how much discount should be given on the printed price so that she can make the same amount of profit?

A) 30%

B) 25%

C) 24%

D) 28%

Difficulty Level – Medium

Topic – Profit and Loss

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Video Solution

Sol 13

If a and b are integers of opposite signs such that $(a + 3)^2 : b^2 = 9 : 1$ and $(a - 1)^2 : (b - 1)^2 = 4 : 1$, then the ratio a : b is:

A) 9:4

B) 81:4

C) 1:4

D) 25:4

Difficulty Level – Hard

Topic – Algebra

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Video Solution

Sol 14

A class consists of 20 boys and 30 girls. In the mid-semester examination, the average score of the girls was 5 higher than that of the boys. In the final exam, however, the average score of the girls dropped by 3 while the average score of the entire class increased by 2. The increase in the average score of the boys is:

A) 9.5

B) 10

C) 4.5

D) 6

Difficulty Level – Medium

Topic – Mixture and Alligation

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Back to Question

Video Solution

Sol 15

The area of the closed region bounded by the equation | x | + | y | = 2 in the two-dimensional plane is

A) 4π

B) 4

C) 8

D) 2π

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Difficulty Level – Easy

Topic – Co-ordinate Geometry

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Video Solution

Sol 16

From a triangle ABC with sides of lengths 40 ft, 25 ft and 35 ft, a triangular portion GBC is cut off where G is the centroid of ABC. The area, in sq ft, of the remaining portion of triangle ABC is:

A) $225\sqrt{3}$

B) $\frac{500}{\sqrt{3}}$

C) $\frac{275}{\sqrt{3}}$

D) $\frac{250}{\sqrt{3}}$

Difficulty Level – Hard

Topic – Geometry

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Video Solution

Sol 17

Let ABC be a right-angled isosceles triangle with hypotenuse BC. Let BQC be a semi-circle, away from A, with diameter BC. Let BPC be an arc of a circle centered at A and lying between BC and BQC. If AB has length 6 cm then the area, in sq. cm, of the region enclosed by BPC and BQC is:

A) 9π - 18

B) 18

C) 9π

D) 9

Difficulty Level – Medium

Topic – Geometry

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Back to Question

Video Solution

Sol 18

A solid metallic cube is melted to form five solid cubes whose volumes are in the ratio 1 : 1 : 8: 27: 27. The percentage by which the sum of the surface areas of these five cubes exceeds the surface area of the original cube is nearest to:

A) 10

B) 50

C) 60

D) 20

Difficulty Level – Medium

Topic – Mensuration and Geometry

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Back to Question

Video Solution

Sol 19

A ball of diameter 4 cm is kept on top of a hollow cylinder standing vertically. The height of the cylinder is 3 cm, while its volume is 9 π cm^3. Then the vertical distance, in cm, of the topmost point of the ball from the base of the cylinder is:

(TITA)

Answer: **6**

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Difficulty Level – Hard

Topic – Mensuration and Geometry

Back to Question

Video Solution

Sol 20

Let ABC be a right-angled triangle with BC as the hypotenuse. Lengths of AB and AC are 15 km and 20 km, respectively. The minimum possible time, in minutes, required to reach the hypotenuse from A at a speed of 30 km per hour is:

(TITA)

Answer: **24**

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Difficulty Level – Medium

Topic – Geometry

Back to Question

Video Solution

Sol 21

Suppose, $\log_3 x = \log_{12} y = a$, where x, y are positive numbers. If G is the geometric mean of x and y, and $\log_6 G$ is equal to:

A) $\sqrt{a}$

B) 2a

C) $\frac{a}{2}$

D) a

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Difficulty Level – Hard

Topic – Exponents and Logarithms

Back to Question

Video Solution

Sol 22

If $x + 1 = x^2$ and $x > 0$, then $2x^4$ is:

A) $6 + 4\sqrt{5}$

B) $3 + 5\sqrt{5}$

C) $5 + 3\sqrt{5}$

D) $7 + 3\sqrt{5}$

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Difficulty Level – Hard

Topic – Algebra

Back to Question

Video Solution

Sol 23

The value of $\log_{0.008}\sqrt{5} + \log_{\sqrt{3}} 81 - 7$ is equal to:

A) $\frac{1}{3}$

B) $\frac{2}{3}$

C) $\frac{5}{6}$

D) $\frac{7}{6}$

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Difficulty Level – Medium

Topic – Exponents and Logarithms

Back to Question

Video Solution

Sol 24

If $9^{2x-1} - 81^{x-1} = 1944$, then x is

A) 3

B) $\frac{9}{4}$

C) $\frac{4}{9}$

D) $\frac{1}{3}$

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Difficulty Level – Medium

Topic – Exponents and Logarithms

Back to Question

Video Solution

Sol 25

The number of solutions (x, y, z) to the equation $x - y - z = 25$, where x, y, and z are positive integers such that $x \leq 40$, $y \leq 12$, and $z \leq 12$ is

A) 101

B) 99

C) 87

D) 105

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Difficulty Level – Hard

Topic – Permutation and Combination

Back to Question

Video Solution

Sol 26

For how many integers n, will the inequality $(n - 5)(n - 10) - 3(n - 2) \leq 0$ be satisfied?

(TITA)

Answer: **11**

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Difficulty Level – Hard

Topic – Inequalities

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Video Solution

Sol 27

If $f_1(x) = x^2 + 11x + n$ and $f_2(x) = x$, then the largest positive integer n for which the equation $f_1(x) = f_2(x)$ has two distinct real roots, is:

(TITA)

Answer: **24**

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Difficulty Level – Medium

Topic – Functions

Back to Question

Video Solution

Sol 28

If a, b, c, and d are integers such that a + b + c + d = 30, then the minimum possible value of $(a - b)^2 + (a - c)^2 + (a - d)^2$ is

(TITA)

Answer: **2**

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Difficulty Level – Hard

Topic – Algebra

Back to Question

Video Solution

Sol 29

Let AB, CD, EF, GH, and JK be five diameters of a circle with center at O. In how many ways can three points be chosen out of A, B, C, D, E, F, G, *H*, J, K, and O so as to form a triangle?

(TITA)

Answer: **160**

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Difficulty Level – Hard

Topic – Permutation and Combination

Back to Question

Video Solution

Sol 30

The shortest distance of the point $(\frac{1}{2},1)$ from the curve $y = |x - 1| + |x + 1|$ is

A) 1

B) 0

C) $\sqrt{2}$

D) $\sqrt{\frac{3}{2}}$

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Difficulty Level – Hard

Topic – Co-ordinate Geometry

Back to Question

Video Solution

Sol 31

If the square of the 7th term of an arithmetic progression with positive common difference equals the product of the 3rd and 17th terms, then the ratio of the first term to the common difference is:

A) 2: 3

B) 3 : 2

C) 3: 4

D) 4: 3

Difficulty Level – Medium

Topic – Progressions

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Back to Question

Video Solution

Sol 32

In how many ways can 7 identical erasers be distributed among 4 kids in such a way that each kid gets at least one eraser but nobody gets more than 3 erasers?

A) 16

B) 20

C) 14

D) 15

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Difficulty Level – Hard

Topic – Permutation and Combination

Back to Question

Video Solution

Sol 33

If $f(x)=\frac{5x+2}{3x-5}$ and $g(x) = x^2 - 2x - 1$, then the value of $g(f(f(3)))$ is:

A) 2

B) $\frac{1}{3}$

C) 6

D) $\frac{2}{3}$

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Difficulty Level – Medium

Topic – Functions

Back to Question

Video Solution

Sol 34

Let $a_1, a_2, \ldots\ldots a_{3n}$ be an arithmetic progression with $a_1 = 3$ and $a_2 = 7$. If $a_1 + a_2 + \ldots + a_{3n} = 1830$, then what is the smallest positive integer m such that $m(a_1 + a_2 + \ldots + a_n) > 1830$?

A) 8

B) 9

C) 10

D) 11

Difficulty Level – Medium

Topic – Progressions

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