

CAT 2017 Slot 2 – Quantitative Ability



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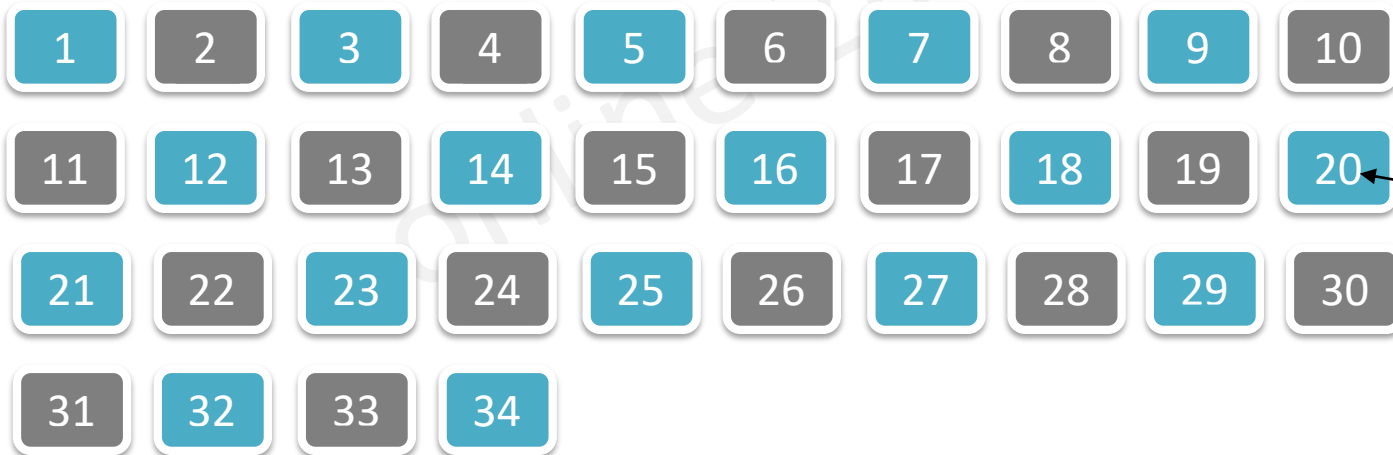
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CAT 2017 Slot 2 – Quantitative Ability

Number of Questions: 34

Duration: 1 Hr

Section Marks: $34 * 3 = 102$ Marks



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Qn 1

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The numbers 1, 2, ..., 9 are arranged in a 3 X 3 square grid in such a way that each number occurs once and the entries along each column, each row, and each of the two diagonals add up to the same value.

If the top left and the top right entries of the grid are 6 and 2, respectively, then the bottom middle entry is:

[TITA]

[Click to see the correct answer](#)

Answer

[Click to view video Solution
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Video Solution

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Qn 2

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In a 10 km race. A, B, and C, each running at uniform speed, get the gold, silver, and bronze medals, respectively. If A beats B by 1 km and B beats C by 1 km, then by how many metres does A beat C?

[TITA]

Answer

Video Solution

Qn 3

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Bottle 1 contains a mixture of milk and water in 7 : 2 ratio and Bottle 2 contains a mixture of milk and water in 9 : 4 ratio. In what ratio of volumes should the liquids in Bottle 1 and Bottle 2 be combined to obtain a mixture of milk and water in 3 : 1 ratio?

- A) 27:14
- B) 27:13
- C) 27:16
- D) 27:18

Answer

Video Solution

Qn 4

Arun drove from home to his hostel at 60 miles per hour. While returning home he drove half way along the same route at a speed of 25 miles per hour and then took a bypass road which increased his driving distance by 5 miles, but allowed him to drive at 50 miles per hour along this bypass road. If his return journey took 30 minutes more than his onward journey, then the total distance travelled by him is:

- A) 55 miles
- B) 60 miles
- C) 65 miles
- D) 70 miles

Answer

Video Solution

Qn 5

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Out of the shirts produced in a factory, 15% are defective, while 20% of the rest are sold in the domestic market. If the remaining 8840 shirts are left for export, then the number of shirts produced in the factory is

- A) 13600
- B) 13000
- C) 13400
- D) 14000

Answer

Video Solution

Qn 6

The average height of 22 toddlers increases by 2 inches when two of them leave this group. If the average height of these two toddlers is one-third the average height of the original 22, then the average height, in inches, of the remaining 20 toddlers is

- A) 30
- B) 28
- C) 32
- D) 26

Answer

Video Solution

Qn 7

The manufacturer of a table sells it to a wholesale dealer at a profit of 10%. The wholesale dealer sells the table to a retailer at a profit of 30%. Finally, the retailer sells it to a customer at a profit of 50%. If the customer pays Rs 4290 for the table, then its manufacturing cost (in Rs) is

- A) 1500
- B) 2000
- C) 2500
- D) 3000

Answer

Video Solution

Qn 8

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A tank has an inlet pipe and an outlet pipe. If the outlet pipe is closed then the inlet pipe fills the empty tank in 8 hours. If the outlet pipe is open then the inlet pipe fills the empty tank in 10 hours. If only the outlet pipe is open then in how many hours the full tank becomes half-full?

- A) 20
- B) 30
- C) 40
- D) 45

Answer

Video Solution

Qn 9

Mayank buys some candies for Rs 15 a dozen and an equal number of different candies for Rs 12 a dozen. He sells all for Rs 16.50 a dozen and makes a profit of Rs 150. How many dozens of candies did he buy altogether?

- A) 50
- B) 30
- C) 25
- D) 45

Answer

Video Solution

Qn 10

In a village, the production of food grains increased by 40% and the per capita production of food grains increased by 27% during a certain period. The percentage by which the population of the village increased during the same period is nearest to

- A) 16
- B) 13
- C) 10
- D) 7

Answer

Video Solution

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Qn 11

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If a , b , c are three positive integers such that a and b are in the ratio $3 : 4$ while b and c are in the ratio $2 : 1$, then which one of the following is a possible value of $(a + b + c)$?

- A) 201
- B) 205
- C) 207
- D) 210

Answer

Video Solution

Qn 12

A motorbike leaves point A at 1 pm and moves towards point B at a uniform speed. A car leaves point B at 2 pm and moves towards point A at a uniform speed which is double that of the motorbike. They meet at 3:40 pm at a point which is 168 km away from A. What is the distance, in km, between A and B?

- A) 364
- B) 378
- C) 380
- D) 388

Answer

Video Solution

Qn 13

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Amal can complete a job in 10 days and Bimal can complete it in 8 days. Amal, Bimal and Kamal together complete the job in 4 days and are paid a total amount of Rs 1000 as remuneration. If this amount is shared by them in proportion to their work, then Kamal's share, in rupees, is

- A) 100
- B) 200
- C) 300
- D) 400

Answer

Video Solution

Qn 14

Consider three mixtures - the first having water and liquid A in the ratio 1 : 2, the second having water and liquid B in the ratio 1 : 3, and the third having water and liquid C in the ratio 1 : 4. These three mixtures of A, B, and C, respectively, are further mixed in the proportion 4 : 3 : 2. Then the resulting mixture has

- A) The same amount of water and liquid B
- B) The same amount of liquids B and C
- C) More water than liquid B
- D) More water than liquid A

Answer

Video Solution

Qn 15

Let ABCDEF be a regular hexagon with each side of length 1 cm. The area (in sq cm) of a square with AC as one side is

- A) $3\sqrt{2}$
- B) 3
- C) 4
- D) $\sqrt{3}$

Answer

Video Solution

Qn 16

The base of a vertical pillar with uniform cross section is a trapezium whose parallel sides are of lengths 10 cm and 20 cm while the other two sides are of equal length. The perpendicular distance between the parallel sides of the trapezium is 12 cm. If the height of the pillar is 20 cm, then the total area, in sq cm, of all six surfaces of the pillar is

- A) 1300
- B) 1340
- C) 1480
- D) 1520

Answer

Video Solution

Qn 17

The points (2, 5) and (6, 3) are two end points of a diagonal of a rectangle. If the other diagonal has the equation $y = 3x + c$, then c is

- A) - 5
- B) - 6
- C) - 7
- D) - 8

Answer

Video Solution

Qn 18

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ABCD is a quadrilateral inscribed in a circle with centre O. If $\angle COD = 120$ degrees and $\angle BAC = 30$ degrees, then the value of $\angle BCD$ (in degrees) is [TITA]

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Answer

Video Solution

Qn 19

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If three sides of a rectangular park have a total length 400 ft., then the area of the park is maximum when the length (in ft.) of its longer side is

[TITA]

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Answer

Video Solution

Qn 20

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Let P be an interior point of a right-angled isosceles triangle ABC with hypotenuse AB. If the perpendicular distance of P from each of AB, BC, and CA is $4(\sqrt{2} - 1)$ cm, then the area, in sq. cm, of the triangle ABC is [TITA]

Answer

Video Solution

Qn 21

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If the product of three consecutive positive integers is 15600 then the sum of the squares of these integers is

- A) 1777
- B) 1785
- C) 1875
- D) 1877

Answer

Video Solution

Qn 22

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If x is a real number such that $\log_3 5 = \log_5(2 + x)$, then which of the following is true?

- A) $0 < x < 3$
- B) $23 < x < 30$
- C) $x > 30$
- D) $3 < x < 23$

Answer

Video Solution

Qn 23

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Let $f(x) = x^2$ and $g(x) = 2^x$, for all real x . Then the value of $f(f(g(x)) + g(f(x)))$ at $x = 1$ is

- A) 16
- B) 18
- C) 36
- D) 40

Answer

Video Solution

Qn 24

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The minimum possible value of the sum of the squares of the roots of the equation $x^2 + (a + 3)x - (a + 5) = 0$ is

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

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Answer

Video Solution

Qn 25

If $9^{x - \frac{1}{2}} - 2^{2x - 2} = 4^x - 3^{2x - 3}$, then x is

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

B) $\frac{2}{5}$

C) $\frac{3}{4}$

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

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Answer

Video Solution

Qn 26

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If $\log(2^a \times 3^b \times 5^c)$ is the arithmetic mean of $\log(2^2 \times 3^3 \times 5)$, $\log(2^6 \times 3 \times 5^7)$, and $\log(2 \times 3^2 \times 5^4)$, then a equals

[TITA]

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Answer

Video Solution

Qn 27

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Let a_1, a_2, a_3, a_4, a_5 be a sequence of five consecutive odd numbers. Consider a new sequence of five consecutive even numbers ending with $2a_3$.

If the sum of the numbers in the new sequence is 450, then a_5 is

[TITA]

Answer

Video Solution

Qn 28

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How many different pairs (a, b) of positive integers are there such that $a \leq b$

$$\text{and } \frac{1}{a} + \frac{1}{b} = \frac{1}{9}?$$

[TITA]

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Answer

Video Solution

Qn 29

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In how many ways can 8 identical pens be distributed among Amal, Bimal, and Kamal so that Amal gets at least 1 pen, Bimal gets at least 2 pens, and Kamal gets at least 3 pens?

[TITA]

Answer

Video Solution

Qn 30

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How many four digit numbers, which are divisible by 6, can be formed using the digits 0, 2, 3, 4, 6, such that no digit is used more than once and 0 does not occur in the left-most position?

[TITA]

Answer

Video Solution

Qn 31

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If $f(ab) = f(a)f(b)$ for all positive integers a and b , then the largest possible value of $f(1)$ is

[TITA]

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Answer

Video Solution

Qn 32

Let $f(x) = 2x - 5$ and $g(x) = 7 - 2x$. Then $|f(x) + g(x)| = |f(x)| + |g(x)|$ if and only if

A) $\frac{5}{2} < x < \frac{7}{2}$

B) $x \leq \frac{5}{2}$ or $x \geq \frac{7}{2}$

C) $x < \frac{5}{2}$ or $x \geq \frac{7}{2}$

D) $\frac{5}{2} \leq x \leq \frac{7}{2}$

Answer

Video Solution

Qn 33

An infinite geometric progression a_1, a_2, a_3, \dots has the property that $a_n = 3(a_{n+1} + a_{n+2} + \dots)$ for every $n \geq 1$. If the sum $a_1 + a_2 + a_3 + \dots = 32$, then a_5 is

- A) $\frac{1}{32}$
- B) $\frac{2}{32}$
- C) $\frac{3}{32}$
- D) $\frac{4}{32}$

Answer

Video Solution

Qn 34

If $a_1 = \frac{1}{2 \times 5}$, $a_2 = \frac{1}{5 \times 8}$, $a_3 = \frac{1}{8 \times 11}$, ..., then $a_1 + a_2 + a_3 + \dots + a_{100}$ is

A) $\frac{25}{151}$

B) $\frac{1}{2}$

C) $\frac{1}{4}$

D) $\frac{111}{55}$

Answer

Video Solution

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Solution

- 1) 3 ← Click to go "Back to Answer page"
- 2) 1900
- 3) 27:13
- 4) 65
- 5) 13000
- 6) 32
- 7) 2000
- 8) 20
- 9) 50
- 10) 10
- 11) 207
- 12) 378
- 13) 100
- 14) Choice 3
- 15) 3
- 16) 1480
- 17) -8
- 18) 90
- 19) 200
- 20) 16
- 21) 1877
- 22) Choice 4
- 23) 36
- 24) 3
- 25) Choice A
- 26) 3
- 27) 51
- 28) 3
- 29) 6
- 30) 50
- 31) 1
- 32) Choice D
- 33) Choice C
- 34) Choice A

Sol 1

Click to see "overall Solution page"

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The numbers 1, 2, ..., 9 are arranged in a 3 X 3 square grid in such a way that each number occurs once and the entries along each column, each row, and each of the two diagonals add up to the same value.

If the top left and the top right entries of the grid are 6 and 2, respectively, then the bottom middle entry is:

[TITA]

Click to go "Back to Question"

Back to Question

Answer: 3

Difficulty Level – Easy

Topic – Number Theory

Video Solution

Sol 2

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In a 10 km race. A, B, and C, each running at uniform speed, get the gold, silver, and bronze medals, respectively. If A beats B by 1 km and B beats C by 1 km, then by how many metres does A beat C?

[TITA]

Answer: **1900**

Difficulty Level – Easy

Topic – Races

Back to Question

Video Solution

Sol 3

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Bottle 1 contains a mixture of milk and water in 7 : 2 ratio and Bottle 2 contains a mixture of milk and water in 9 : 4 ratio. In what ratio of volumes should the liquids in Bottle 1 and Bottle 2 be combined to obtain a mixture of milk and water in 3 : 1 ratio?

- A) 27:14
- B) 27:13**
- C) 27:16
- D) 27:18

Difficulty Level –  Medium

Topic – **Mixtures**

Back to Question

Video Solution

Sol 4

Arun drove from home to his hostel at 60 miles per hour. While returning home he drove half way along the same route at a speed of 25 miles per hour and then took a bypass road which increased his driving distance by 5 miles, but allowed him to drive at 50 miles per hour along this bypass road. If his return journey took 30 minutes more than his onward journey, then the total distance travelled by him is:

- A) 55 miles
- B) 60 miles
- C) 65 miles**
- D) 70 miles

Difficulty Level –  Medium

Topic – **Speed, Time and Distance**

Sol 5

Out of the shirts produced in a factory, 15% are defective, while 20% of the rest are sold in the domestic market. If the remaining 8840 shirts are left for export, then the number of shirts produced in the factory is

- A) 13600
- B) 13000**
- C) 13400
- D) 14000

Difficulty Level – Easy

Topic – Percentages

Back to Question

Video Solution

Sol 6

The average height of 22 toddlers increases by 2 inches when two of them leave this group. If the average height of these two toddlers is one-third the average height of the original 22, then the average height, in inches, of the remaining 20 toddlers is

- A) 30
- B) 28
- C) 32**
- D) 26

Difficulty Level – Easy

Topic – **Averages**

Sol 7

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The manufacturer of a table sells it to a wholesale dealer at a profit of 10%. The wholesale dealer sells the table to a retailer at a profit of 30%. Finally, the retailer sells it to a customer at a profit of 50%. If the customer pays Rs 4290 for the table, then its manufacturing cost (in Rs) is

- A) 1500
- B) 2000**
- C) 2500
- D) 3000

Difficulty Level – Medium

Topic – Profit and Loss

Back to Question

Video Solution

Sol 8

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A tank has an inlet pipe and an outlet pipe. If the outlet pipe is closed then the inlet pipe fills the empty tank in 8 hours. If the outlet pipe is open then the inlet pipe fills the empty tank in 10 hours. If only the outlet pipe is open then in how many hours the full tank becomes half-full?

- A) 20
- B) 30
- C) 40
- D) 45

Difficulty Level –  Medium

Topic – Pipes and Cisterns

Back to Question

Video Solution

Sol 9

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Mayank buys some candies for Rs 15 a dozen and an equal number of different candies for Rs 12 a dozen. He sells all for Rs 16.50 a dozen and makes a profit of Rs 150. How many dozens of candies did he buy altogether?

- A) 50
- B) 30
- C) 25
- D) 45

Difficulty Level – Easy

Topic – Profit and Loss

Back to Question

Video Solution

Sol 10

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In a village, the production of food grains increased by 40% and the per capita production of food grains increased by 27% during a certain period. The percentage by which the population of the village increased during the same period is nearest to

- A) 16
- B) 13
- C) 10**
- D) 7

Difficulty Level –  Medium

Topic – Percentages

Back to Question

Video Solution

Sol 11

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If a , b , c are three positive integers such that a and b are in the ratio $3 : 4$ while b and c are in the ratio $2 : 1$, then which one of the following is a possible value of $(a + b + c)$?

- A) 201
- B) 205
- C) 207**
- D) 210

Difficulty Level – Medium

Topic – Ratios

Back to Question

Video Solution

Sol 12

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A motorbike leaves point A at 1 pm and moves towards point B at a uniform speed. A car leaves point B at 2 pm and moves towards point A at a uniform speed which is double that of the motorbike. They meet at 3:40 pm at a point which is 168 km away from A. What is the distance, in km, between A and B?

- A) 364
- B) 378**
- C) 380
- D) 388

Difficulty Level –

Medium

Topic – **Speed, Time and Distance**

Back to Question

Video Solution

Sol 13

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Amal can complete a job in 10 days and Bimal can complete it in 8 days. Amal, Bimal and Kamal together complete the job in 4 days and are paid a total amount of Rs 1000 as remuneration. If this amount is shared by them in proportion to their work, then Kamal's share, in rupees, is

- A) 100
- B) 200
- C) 300
- D) 400

Difficulty Level – **Medium**

Topic – **Work and Time**

Back to Question

Video Solution

Sol 14

Consider three mixtures - the first having water and liquid A in the ratio 1 : 2, the second having water and liquid B in the ratio 1 : 3, and the third having water and liquid C in the ratio 1 : 4. These three mixtures of A, B, and C, respectively, are further mixed in the proportion 4 : 3 : 2. Then the resulting mixture has

- A) The same amount of water and liquid B
- B) The same amount of liquids B and C**
- C) More water than liquid B
- D) More water than liquid A

Difficulty Level –  Hard

Topic – **Mixtures**

Sol 15

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Let ABCDEF be a regular hexagon with each side of length 1 cm. The area (in sq cm) of a square with AC as one side is

- A) $3\sqrt{2}$
- B) 3**
- C) 4
- D) $\sqrt{3}$

Difficulty Level – Medium

Topic – Geometry

Back to Question

Video Solution

Sol 16

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The base of a vertical pillar with uniform cross section is a trapezium whose parallel sides are of lengths 10 cm and 20 cm while the other two sides are of equal length. The perpendicular distance between the parallel sides of the trapezium is 12 cm. If the height of the pillar is 20 cm, then the total area, in sq cm, of all six surfaces of the pillar is

- A) 1300
- B) 1340
- C) 1480**
- D) 1520

Difficulty Level –  Medium

Topic – **Geometry**

Back to Question

Video Solution

Sol 17

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The points (2, 5) and (6, 3) are two end points of a diagonal of a rectangle. If the other diagonal has the equation $y = 3x + c$, then c is

- A) - 5
- B) - 6
- C) - 7
- D) - 8**

Difficulty Level –  Medium

Topic – **Co-ordinate Geometry**

Back to Question

Video Solution

Sol 18

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ABCD is a quadrilateral inscribed in a circle with centre O. If $\angle COD = 120$ degrees and $\angle BAC = 30$ degrees, then the value of $\angle BCD$ (in degrees) is [TITA]

Answer: **90**

Difficulty Level – Medium

Topic – Geometry

Back to Question

Video Solution

Sol 19

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If three sides of a rectangular park have a total length 400 ft., then the area of the park is maximum when the length (in ft.) of its longer side is

[TITA]

Answer: **200**

Difficulty Level –  Hard

Topic – **Geometry**

Back to Question

Video Solution

Sol 20

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Let P be an interior point of a right-angled isosceles triangle ABC with hypotenuse AB. If the perpendicular distance of P from each of AB, BC, and CA is $4(\sqrt{2} - 1)$ cm, then the area, in sq. cm, of the triangle ABC is [TITA]

Answer: **16**

Difficulty Level – **Medium**

Topic – **Geometry**

Back to Question

Video Solution

Sol 21

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If the product of three consecutive positive integers is 15600 then the sum of the squares of these integers is

- A) 1777
- B) 1785
- C) 1875
- D) 1877**

Difficulty Level –  Hard

Topic – **Number Theory**

Back to Question

Video Solution

Sol 22

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If x is a real number such that $\log_3 5 = \log_5(2 + x)$, then which of the following is true?

- A) $0 < x < 3$
- B) $23 < x < 30$
- C) $x > 30$
- D) $3 < x < 23$**

Difficulty Level –

Hard

Topic – Exponents & Logarithms

Back to Question

Video Solution

Sol 23

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Let $f(x) = x^2$ and $g(x) = 2^x$, for all real x . Then the value of $f(f(g(x)) + g(f(x)))$ at $x = 1$ is

- A) 16
- B) 18
- C) 36**
- D) 40

Difficulty Level – Medium

Topic – **Functions**

Back to Question

Video Solution

Sol 24

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The minimum possible value of the sum of the squares of the roots of the equation $x^2 + (a + 3)x - (a + 5) = 0$ is

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

Difficulty Level – Medium

Topic – Quadratic Equations

Back to Question

Video Solution

Sol 25

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If $9^{x - (\frac{1}{2})} - 2^{2x - 2} = 4^x - 3^{2x - 3}$, then x is

- A) $\frac{3}{2}$
- B) $\frac{2}{5}$
- C) $\frac{3}{4}$
- D) $\frac{4}{9}$

Difficulty Level –  Medium

Topic – Exponents & Logarithms

Back to Question

Video Solution

Sol 26

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If $\log(2^a \times 3^b \times 5^c)$ is the arithmetic mean of $\log(2^2 \times 3^3 \times 5)$, $\log(2^6 \times 3 \times 5^7)$, and $\log(2 \times 3^2 \times 5^4)$, then a equals

[TITA]

Answer: **3**

Difficulty Level –  Hard

Topic – Exponents & Logarithms

Back to Question

Video Solution

Sol 27

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Let a_1, a_2, a_3, a_4, a_5 be a sequence of five consecutive odd numbers. Consider a new sequence of five consecutive even numbers ending with $2a_3$.

If the sum of the numbers in the new sequence is 450, then a_5 is

[TITA]

Answer: **51**

Difficulty Level –  Medium

Topic – **Progressions**

Back to Question

Video Solution

Sol 28

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How many different pairs (a, b) of positive integers are there such that $a \leq b$

$$\text{and } \frac{1}{a} + \frac{1}{b} = \frac{1}{9}?$$

[TITA]

Answer: **3**

Difficulty Level –  Hard

Topic – **Number Theory**

Back to Question

Video Solution

Sol 29

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In how many ways can 8 identical pens be distributed among Amal, Bimal, and Kamal so that Amal gets at least 1 pen, Bimal gets at least 2 pens, and Kamal gets at least 3 pens?

[TITA]

Answer: **6**

Difficulty Level –  Medium

Topic – **Permutation and Combination**

Back to Question

Video Solution

Sol 30

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How many four digit numbers, which are divisible by 6, can be formed using the digits 0, 2, 3, 4, 6, such that no digit is used more than once and 0 does not occur in the left-most position?

[TITA]

Answer: **50**

Difficulty Level –  Hard

Topic – **Permutation and Combination**

Back to Question

Video Solution

Sol 31

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If $f(ab) = f(a)f(b)$ for all positive integers a and b , then the largest possible value of $f(1)$ is

[TITA]

Answer: **1**

Difficulty Level –  Medium

Topic – **Functions**

Back to Question

Video Solution

Sol 32

Let $f(x) = 2x - 5$ and $g(x) = 7 - 2x$. Then $|f(x) + g(x)| = |f(x)| + |g(x)|$ if and only if

A) $\frac{5}{2} < x < \frac{7}{2}$

B) $x \leq \frac{5}{2}$ or $x \geq \frac{7}{2}$

C) $x < \frac{5}{2}$ or $x \geq \frac{7}{2}$

D) $\frac{5}{2} \leq x \leq \frac{7}{2}$

Difficulty Level – **Hard**

Topic – **Functions**

Back to Question

Video Solution

Sol 33

An infinite geometric progression a_1, a_2, a_3, \dots has the property that $a_n = 3(a_{n+1} + a_{n+2} + \dots)$ for every $n \geq 1$. If the sum $a_1 + a_2 + a_3 + \dots = 32$, then a_5 is

- A) $\frac{1}{32}$
- B) $\frac{2}{32}$
- C) $\frac{3}{32}$
- D) $\frac{4}{32}$

Difficulty Level –  Medium

Topic – Progressions

Sol 34

If $a_1 = \frac{1}{2 \times 5}$, $a_2 = \frac{1}{5 \times 8}$, $a_3 = \frac{1}{8 \times 11}$, ..., then $a_1 + a_2 + a_3 + \dots + a_{100}$ is

A) $\frac{25}{151}$

B) $\frac{1}{2}$

C) $\frac{1}{4}$

D) $\frac{111}{55}$

Difficulty Level – **Medium**

Topic – **Progressions**

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