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Maths Questions for RBI Grade B Phase - 1 Exam.

RBI Grade B Maths Quiz 3

Directions: Kindly study the following Questions carefully and choose the right answer:

1. Sourav Ganguly wants to buy a total of 100 sports equipment using exactly a sum of Rs.1000. He can buy ball at Rs.20 per unit, wicket at Rs.5 per unit and bat at Rs.1 per unit. If he has to buy at least one of each equipment and cannot buy any other type of equipment, then in how many distinct ways can he make his purchase?

A. 5   B. 2   C. 3   D. 6   E. 1

**2.** **The table below shows the distribution of the students in different schools in Pune.**

School	Percentage
DPS	31.25
PPS	12.50
DAV	18.75
KV	15.00
RPS	10.00
Carmel	12.50

If the number of students in DAV, DPS and PPS is 250 and the ratio of the number of girls to boys in DPS is 3 : 2, find the number of girls in DPS.

A. 45   B. 55   C. 65   D. 75   E. 85

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3. In the following figure, Δ ABC is a right angled triangle, right angled at B, intersecting the circle at E, B and D. AD is the angle bisector of ∠ BAC.
AB = 72 cm and AC = 75 cm. Also, BE and BD are two equal chords of the circle. What is the area of the given circle?
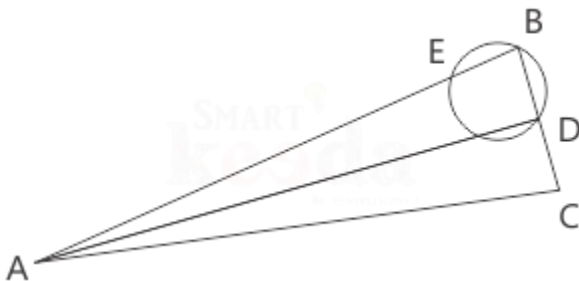
A. $\dfrac{1152\,\pi}{49}$ B. $\dfrac{648\,\pi}{49}$ C. $\dfrac{2592\,\pi}{49}$ D. Data insufficient   E. None of these

4. Medha goes to a stationary shop and buy 4 pink sketch pens and some yellow sketch pens. The price of a pink sketch pen was twice that of the yellow sketch pen. When shopkeeper calculated the amount, it was found that the number of sketch pens of two colors had been interchanged. This increase the amount by 50%. What is the difference between the number of pink sketch pens to the number of yellow sketch pens in the original order?

A. 12   B. 16   C. 20   D. 8   E. None of these

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5. Ganguly plays a game wherein he tosses a coin a certain number of times. Each time the coin turns up heads, Ganguly is paid Rs. 385 and each time it turns up tails, he has to pay Rs. 150. Ganguly wins a net amount of Rs. 2030 by tossing the coin 'n' times. If the total number of tosses is less than 30, find the number of times the coin was tossed.

A. 5   B. 12   C. 15   D. 22   E. 25

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6. Three son of Mr. Sharma viz. Ramu, Hari and Mahesh are living in Delhi. Mr. Sharma is also living with them. Ramu's salary and Mahesh's salary put together is Rs.125000. Ramu's salary is 25% of Hari's salary and Mahesh's salary put together. Mahesh's salary is Rs.50000 less than Hari's salary. Mr sharma doesn't work. Ramu, Hari and Mahesh give 15% of his salary to Mr. sharma, out of which Mr. sharma donates 20% to a temple and saves the rest. What is the saving of Mr. sharma?

A. Rs. 18000   B. Rs. 24500   C. Rs. 30000   D. Rs. 32150   E. Rs. 35000

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7. In MG Road Delhi PVR has 300 seats. The price of each ticket, when the theatre is houseful, is Rs.60. For every Rs.1 increase in the price of the ticket, the number of tickets sold goes down by 2. What is the price of the ticket (in Rs.) for which the theatre owner would earn the maximum possible revenue?

A. Rs. 90   B. Rs. 105   C. Rs. 120   D. Rs. 150   E. Rs. 175

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8. Two daily workers Rajesh and Dinesh agreed to complete a work in MNREGA for Rs.1200. They can complete the work in 10 days and 20 days respectively, working alone. Since another person Sameer also joined them, they completed the work in six days. What is the share of the wages of the most efficient person of the three?

A. Rs. 440   B. Rs. 570   C. Rs. 610   D. Rs. 720   E. None of these

9. Ganpat and Soren are two students of DPS Delhi. Teacher has given a quadratic equation in the classroom with leading coefficient 1. Ganpat made a mistake in copying the constant term of the equation and got a root as 12. Soren made a mistake in copying the coefficient of y as well as the constant term and got a root as 2. If later, they realized that the mistakes they committed were only in copying the signs, What is the difference between the roots of the original equation?

A. 1 or –1   B. 2 or –2   C. 3 or –3   D. 4 or –4   E. None of these

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10. In the given figure, CD is the chord of a circle with centre O, CD is extended to A such that AD is equal to the radius of the circle r and AO meets the circle at E and B, if m ∠BOC = 84˚, then what is m ∠CAB?
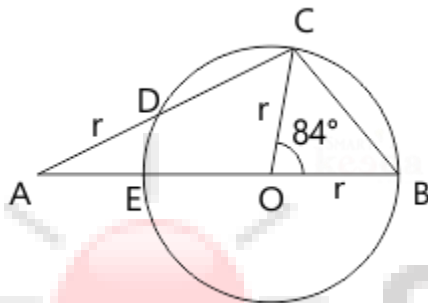
A. 14°   B. 28°   C. 42°   D. 52°   E. Can't be determined

Correct Answers:

1	2	3	4	5	6	7	8	9	10
C	D	C	A	C	C	B	D	B	B

Explanations:

1. Let the number of ball, wickets and bats purchased be A, B and C, respectively.

Thus,

20A + 5B + C = 1000 and A + B + C = 100

Solving the above two equations by eliminating C, we Get

19A + 4B = 900

$\Rightarrow B = 225 - \dfrac{19}{4}A$

Now, as B is the number of wickets and 0 < B < 99,

So, putting these limiting values of B in the above equation will provide the value of A as 27 < A < 47.

Since A has to be the multiple of 4, so possible values of A are 28, 32, 36, 40 and 44.

Now, for A = 28 and 32; A + B > 100, so these values of A can be rejected.

For all other values of A, we get the desired solution:

A = 36, B = 54, C = 10

A = 40, B = 35, C = 25

A = 44, B = 16, C = 40

Thus, there are three possible solutions.

Hence, option (C) is correct.

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2. Percentage of students, in DAV, DPS and PPS = 31.25 + 12.50 + 18.75 = 62.5%

This is equal to 250

$\Rightarrow$ Total strength of the school $= \dfrac{100}{62.5} \times 250$

$= \dfrac{8}{5}(250) = 400$

∴ The number of students in DPS

$= \dfrac{31.25}{100} \times 400 = 125$ students

Ratio of number of girls to boys = 3 : 2

∴ The number of girls in DPS $= \dfrac{3}{5} \times 125 = 75$

Hence, option (D) is correct.

3. As AD is the angle bisector, it divides BC in the same ratio as AB to AC.

$$\therefore \frac{BD}{DC} = \frac{72}{75} = \frac{24}{25}$$

$$\therefore \frac{BD}{BC} = \frac{24}{49}$$

As Δ ABC is a right angled triangle, using the Pythagoras Theorem, ∴ BC = 21 cm

$$\therefore BD = \frac{24}{49} \times 21 = \frac{72}{7} \text{ cm}$$

Also, BD = BE = $\frac{72}{7}$ cm

Δ DBE is an isosceles right angled triangle.

$$\therefore DE = \frac{72\sqrt{2}}{7}$$

As ∠ABC is right angle, clearly DE is the diameter of the circle.

=> Area of the circle = πr^2

∴ The area of given circle = $\pi \left(\frac{72\sqrt{2}}{7 \times 2} \right)^2$

$$= \frac{2592\,\pi}{49}$$

Hence, option (C) is correct.

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4. Let the number of yellow sketch pens be 'x'
The number of pink sketch pens is 4
Let the cost per yellow sketch pens be P
Then, the cost per pink sketch pens is 2P
Original cost = P × x + 4 × 2P = P(x + 8)
Cost after the colors had been interchanged = x × 2P + 4 × P = P (2x + 4)
It is given that this cost is 50% more than the original cost
Hence, P(2x + 4) = 1.5 [P(x + 8)]
⇒ 2x + 4 = 1.5x + 12
⇒ 0.5x = 8
⇒ x = 16
Therefore, the required difference = 16 − 4 = 12.

Hence, option (A) is correct.

5. Let x be the number of times the coin turned up heads and y be the number of times the coin turns up tails.

According to question,

$385x - 150y = 2030 \Rightarrow 77x - 30y = 406$ ..... **(i)**

Since 77x and 406 are multiples of 7 so, 30 y should be a multiple of 7 or y itself is a multiple of 7

Let y = 7z

In (i)

$77x - 30 \times 7z = 406 \Rightarrow 11x - 30z = 58$ .... **(ii)**

By hits and trial,

If z = 1 then y = 7 × 1 = 7 and $x = \dfrac{58 + 30}{11} = 8$

If z = 12 then y = 7 × 12 = 84 and $x = \dfrac{58 + 360}{11} = 38$

If z = 23 then y = 7 × 23 = 161 and $x = \dfrac{58 + 690}{11} = 68$ and so on

But given that the total number of tosses is less than 30

i.e, n = x + y < 30

then only one case is valid, which is x = 8 and y = 7

Thus, the total number of tosses = 8 + 7 = 15

Hence, option (C) is correct.

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6. Let the salary of Ramu, Hari and Mahesh be Rs. x, Rs. y and Rs. z

According to question,

(x + z) = 125000 …. (i)

(x) = 25% of (y + z)

$\Rightarrow 4 \times x = (y + z)$ ..... (ii)

(y – z) = 50000 …. (iii)

From (i) and (ii)

4 × (125000 – z) = (y + z)

$\Rightarrow (y + 5z) = 500000$ …. (iv)

From (iii) and (iv)

$\Rightarrow z = 75000$

Putting the value of z in (iii), we get

y = 125000

Putting the value of z in (i), we get

x = 50000

So, the salary of Ramu, Hari and Mahesh be Rs. 50000, Rs. 125000 and Rs. 75000

Saving of Mr. Sharma = 80% of (15% of (50000 + 125000 + 75000)) = (0.8 × 0.15 × 250000) = Rs. 30000

Hence, option (C) is correct.

7. Let the price of the ticket be = Rs. (60 + x), where x is greater than zero.

The number of people in the audience would then be (300 − 2 × x).

The revenue of the theatre owner be = (60 + x) × (300 − 2 × x)

= (18000 + 180 × x − 2 × x^2)

This is quadratic expression which achieves a maximum value when x

$$= -\frac{\text{coefficient of x}}{2 \times \text{coefficient of x}^2}$$

Quadratic equation has achieved a maximum value when x

$$= -\frac{b}{2a}$$

So, $x = -\dfrac{180}{-2 \times 2} = 45$

Hence, the price of ticket at maximum revenue = (60 + 45) = Rs.105.

Therefore, option (B) is correct.

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8. Work done by the two persons Rajesh and Dinesh in one day

$$= \frac{1}{10} + \frac{1}{20} = \frac{3}{20}$$

Work done in 6 days $= \dfrac{3}{20} \times 6 = \dfrac{9}{10}$

Remaining work $= 1 - \dfrac{9}{10} = \dfrac{1}{10}$

So, Sameer completes $\dfrac{1}{10}$ works in 6 days.

i.e. Sameer can complete the entire work in $\dfrac{10}{1} \times 6 = 60$ days.

And, Rajesh can complete the work in 10 days so, he is the most efficient person among them.

The work done by Rajesh in 6 days $= 6 \times \dfrac{1}{10} = \dfrac{3}{5}$

Rajesh's share of total wages $= \dfrac{3}{5} \times 1200 = $ Rs. 720

Hence, option (D) is correct.

9. Let the correct quadratic equation is $y^2 + a \times y + b = 0$ (As, leading coefficient is one)
The equation copied by Ganpat would have been $y^2 + a \times y - b = 0$
And, 12 is a root of equation when Ganpat solved the equation
So, $144 + 12 \times a - b = 0$ ..... (i)
Now, the equation copied by Soren would have been $y^2 - a \times y - b = 0$
And, 2 is a root of equation when Ganpat solved the equation
So, $4 - 2 \times a - b = 0$ ..... (ii)
Subtract equation (ii) from (i), we get
$14 \times a = -140$
$\Rightarrow a = -10$
Putting the value of a in (ii), we get
$2 \times a = 4 - b$
$\Rightarrow -20 = 4 - b$
$\Rightarrow b = 24$
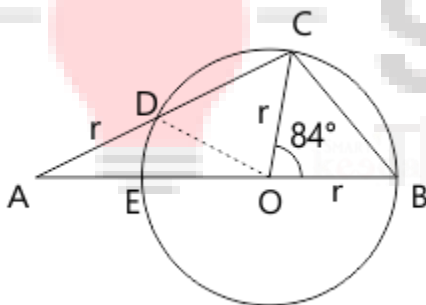Hence, the correct equation is $y^2 - 10 \times y + 24 = 0$
$\Rightarrow (y - 6) \times (y - 4) = 0$
$\Rightarrow y = 6$ or $y = 4$
Hence, difference between root is $(6 - 4) = 2$ or $(4 - 6) = -2$
Therefore, option (B) is correct.

10.

Draw radius OD.
$2 \times m\ \angle CAB = m$ (minor arc BC) $-$ (minor arc DE)
$\therefore 2 \times m\ \angle CAB = m\ \angle BOC - m\ \angle DOE$ ....(i)
Now, in isosceles ΔODA,
$m\ \angle DOE = m\ \angle DAO$ ....(ii)
$m\ \angle DAO = m\ \angle CAB$ ....(iii)
From equations (i), (ii) and (iii), we get,
$2 \times m\ \angle CAB = m\ \angle BOC - m\ \angle CAB$
$\therefore 3 \times m\ \angle CAB = m\ \angle BOC = 84°$
$\therefore m\ \angle CAB = 28°$
Hence, option (B) is correct.