Maths Questions for RBI Grade B Phase - 1 Exam.

RBI Grade B Maths Quiz 1

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

1. A packaging machine A of Kurkure can pack one lakh packets in 10 hours, packaging machine B of Kurkure can pack the same number of packets in 12 hours while packaging machine C can pack them in 15 hours. All the packaging machines are started at 8 a.m. while packaging machine A is closed at 10 a.m. And the remaining two packaging machines complete the work. Approximately at what time will the work be finished?

A. 1 : 20 pm B. 1 : 10 pm C. 1 : 00 pm D. 12 : 50 pm E. None of these

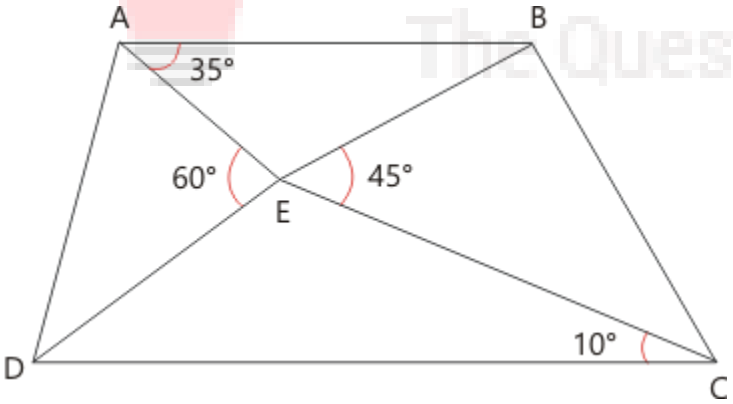
---

2. In the given figure, AB and CD are parallel m∠BAE = 35°, m∠BEC = 45°, m∠AED = 60° and m∠ECD = 10°. Find m∠CED.

A. 105° B. 115° C. 130° D. 145° E. 150°

---

3. Rampaal is a businessman and he goes on a business tour of three cities of Gujarat. In every city he spends Rs.30 more than one-third of the money he has with him. At the end of the tour, he has Rs.1000 left with him. What is the amount with him before he started the tour?



A. Rs. 3270 B. Rs. 3425 C. Rs. 3588 D. Rs. 4156 E. None of these

---

4. Sohan purchased 35 bonds of three different companies Tata, Minda and Kelton Tech and the total cost was Rs. 69600. The prices of each of these bonds were Rs. 1200, Rs. 1800 and Rs. 2400 respectively. He purchased not less than 5 bonds of any company and he purchased an even number of bonds of the company Tata. What is the possible number of bonds of the company Tata and Kelton Tech did he purchase?

A. 22 or 25 B. 22 or 27 C. 23 or 25 D. 23 or 27 E. None of these

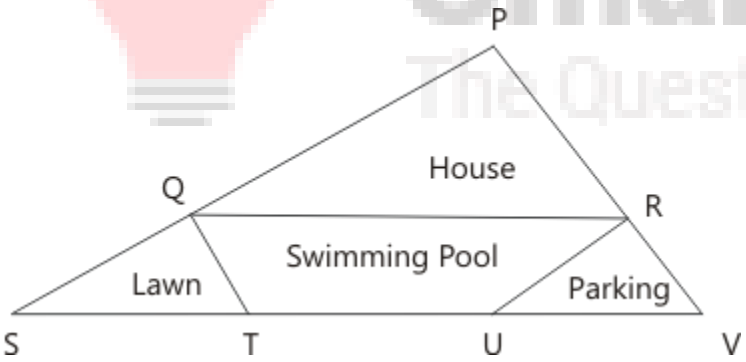
5. The New Delhi - Howrah Rajdhani express is running at 75 kmph takes 15 seconds to pass Dhanbad platform. Next it takes 9 sec to pass a man walking at 5 kmph in the same direction in which the New Delhi - Howrah Rajdhani express is going. Find the length of the New Delhi - Howrah Rajdhani express and the length of the Dhanbad platform.

A. 175m, 137.5m B. 170m, 137.0m C. 160m, 135.5m D. 160m, 137.5m E. None of these

6. In Kolkata consisting of three localities Salt Lake, South Kolkata and Rajarhat the population of the three localities Salt Lake, South Kolkata and Rajarhat are in the ratio 9 : 8 : 3. In Salt Lake, 80% of the people are literate, in South Kolkata, 30% of the people are illiterate. If 90% people in Rajarhat are literate. Find the percentage literacy in these three localities in Kolkata.

A. 77.5% B. 77.0% C. 75.5% D. 75.0% E. None of these

7. Virat Kohli got a plot on his Birthday as a gift. The plot is in shape of a triangle PSV as shown in the figure. He divided the plot into four areas to build a house, a lawn, a parking area and a swimming pool. The boundaries of these areas, namely, QR, RU and TQ were parallel to SV, PS and VP respectively. He allotted area PQR for his house, are SQT for the lawn, area VUR for parking and area QTUR for swimming pool. Q divides PS in the ratio 3 : 1. What is the area (in sq. m.) of the swimming pool if the area of the triangular plot PSV is 4800 sq. m.?

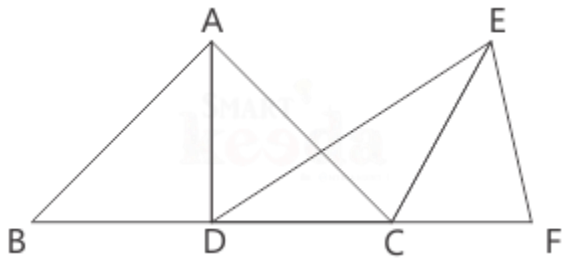


A. 1500 B. 900 C. 1600 D. 400 E. None of these

8. Mr. Amit Saha bought a certain number of sweets for his four sons, such that each would get at least three sweets, and kept them in a pot. The eldest son counted the sweets, and found that one sweet was left after dividing them into four equal groups. So he took one sweet and one of the four groups of sweets. Then, the second son came and found that there were two more sweets after dividing them into four equal groups. He took one group and the extra two sweets. Similarly, the third son took three sweets and one-fourth of the remaining. The fourth son took all the remaining sweets available. What could be the least number of sweets that the man must have bought?

A. 45 B. 152 C. 451 D. 145 E. None of these

9. In ΔABC and ΔDEF, AD and EC are medians. If AB = AC = 5 cm, AD = EC and DE = 7 cm, then EF (in cm) in equal to



A. 12 B. 4 C. 1 D. 3 E. 5

10. Kohli, Jadeja, Raina have some autographs among themselves. Kohli gives to each of Jadeja and Raina one-third of what each of them already has. Then Jadeja does the same, i.e., he gives to each of Kohli and Raina one-third of what each of them already has, after which, Raina also does the same. If all of them now have the same number of autographs, what was the ratio of the initial number of autographs with Kohli, Jadeja and Raina respectively?

A. 25 : 21 : 18 B. 16 : 23 : 25 C. 13 : 17 : 16 D. 16 : 17 : 13 E. None of these

Correct Answers:

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

Explanations:

1. Packaging machine (A, B and C) together work in 1 hours

$= \frac{1}{10} + \frac{1}{12} + \frac{1}{15} = \frac{1}{4}$

Work done by packaging machine (A, B and C) in 2 hours

$= 2 \times \frac{1}{4} = \frac{1}{2}$

Remaining work $= 1 - \frac{1}{2} = \frac{1}{2}$

Packaging machine (B and C) together work in 1 hours

$= \frac{1}{12} + \frac{1}{15} = \frac{3}{20}$

Now, $\frac{3}{20}$ work is done by packaging machine B and C in 1 hour.

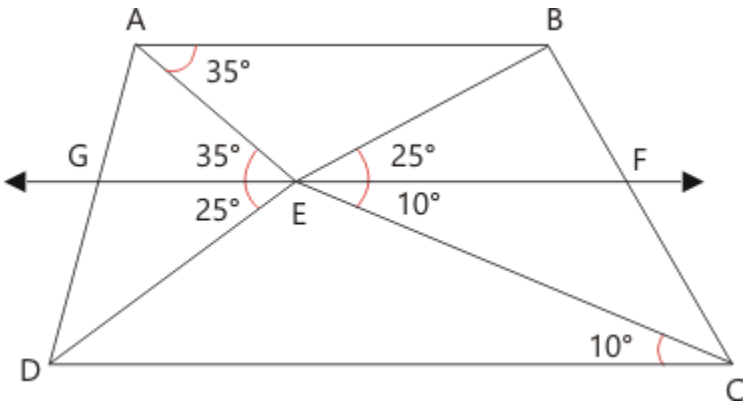
So, $\frac{1}{2}$ work will be done by packaging machine B and C in $\frac{20}{3} \times \frac{1}{2}$

$= \frac{10}{3}$ = 3 hours 20 minutes

Hence, the work will be finished 3 hour 20 minutes after 10 a.m. I.e 1:20 pm.

Therefore, option (A) is correct.

2.



Construct a line EF parallel to AB and CD.
m ∠CEF = m ∠ECD = 10°
(∵ ∠CEF and ∠ECD form a pair of Alternate angles)
m ∠AEG = m ∠EAB = 35°
(∵ ∠AEG and ∠EAB form a pair of Alternate angles)
∴ m ∠GED = 60° – 35° = 25°
But, m ∠GED + m ∠CED + m ∠CEF = 180°
∴ 25° + m ∠CED + 10° = 180°
∴ m ∠CED = 145°
Hence, option D is correct.

3. Let the amount with the Rampaal, before he started the tour of Gujarat be P

In the first city he spends = $\frac{P}{3} + 30$

He would be left with $(P - \frac{P}{3} - 30) = [(\frac{2P}{3}) - 30]$

At the end of the tour of the first city.

In the second city he spends $(\frac{1}{3}) \times [(\frac{2P}{3}) - 30] + 30$

$= \frac{2P}{9} + 20$

He would be left with $[(\frac{2P}{3}) - 30] - [(\frac{2P}{9}) + 20]$

$= \frac{4P}{9} - 50$ at the end of the tour of the second city.

In the third city he spends $(\frac{1}{3}) \times [(\frac{4P}{9}) - 50] + 30$

$= \frac{4P}{27} + \frac{40}{3}$

He would be left with $[\left(\frac{4P}{9}\right) - 50] - [\left(\frac{4P}{27}\right) + \left(\frac{40}{3}\right)]$

$= \frac{8P}{27} - \frac{190}{3}$

Therefore, total amount left with him after the tour = Rs. 1000

$\Rightarrow \frac{8P}{27} - \frac{190}{3} = 1000$

$\Rightarrow \frac{8P}{27} = 1000 + \frac{190}{3}$

$\Rightarrow \frac{8P}{27} = \frac{3190}{3}$

$\Rightarrow \frac{8P}{27} = 1063.33$

$\Rightarrow P = \frac{(1413.33 \times 27)}{8}$

$\Rightarrow$ P = 3588 (approx.)

Hence, the amount with Rampaal, before he started the tour of Gujarat is Rs. 3588

Hence, option C is correct.

---

4. Let the number of bonds purchased of the companies Tata, Minda and Kelton Tech be p, q and r respectively.

Given that,

p + q + r = 35 **……. (i)**

Also, 1200p + 1800q + 2400r = 69600

2p + 3q + 4r = 116 **……. (ii)**

From **(i)** and **(ii)**

q + 2r = 46 **…… (iii)**

As we can see that, in equation (iii), 2r and 46 are even, so q must be also even

Given that p, q ≥ 5

Now,

Q	6	8	10	12	14
R	(46 – 6)/2 = 20	(46 – 8)/2 = 19	(46 – 10)/2 = 18	(46 – 12)/2 = 17	(46 – 14)/2 = 16
P	35 – (6 + 20) = 9	35 – (8 + 19) = 8	35 – (10 + 18) = 7	35 – (12 + 17) = 6	35 – (14 + 16) = 5

As p is even so, p = 8 and p = 6 are the only two possibilities.

If, p = 8 then r = 19

So, (p + r) = (8 + 19) = 27

If, p = 6 then r = 17

So, (p + r) = (6 + 17) = 23

Hence, the number of bonds purchased of the companies Tata and Kelton Tech together be either 23 or 27.

Hence, option D is correct.

5. Let the length of New Delhi – Howrah Rajdhani express be x meters and length of Dhanbad platform be y meters.

Speed of the New Delhi – Howrah Rajdhani express relative to man= (75 – 5) kmph = 70 kmph

$= \frac{70 \times 5}{18}$ m/sec $= \frac{175}{9}$ m/sec

In passing a man, the New Delhi - Howrah Rajdhani express cover its own length with relative speed.

Length of the New Delhi – Howrah Rajdhani express = (Relative speed × Time)

$= \frac{175}{9} \times 9 = 175$ meters.

Also, speed of the New Delhi – Howrah Rajdhani express

$= 75 \times \frac{5}{18} = \frac{125}{6}$m/s

Since, $\frac{x + y}{\frac{125}{6}} = 15$

$x + y = \frac{125 \times 15}{6} = 312.5$

y = 312.5 – 175 = 137.5 meters

Hence, option (A) is correct.

---

6. Let the population of Salt Lake = 9x,

The population of South Kolkata = 8x, and

The population of Rajarhat = 3x

The total population of these three localities = 9x + 8x + 3x = 20x

The number of literate in Salt Lake = 80% of 9x = 7.2x

The number of literate in South Kolkata = 70% of 8x = 5.6 x

The number of literate in Rajarhat = 90% of 3x = 2.7x

The total number of literate in these three localities = 7.2x + 5.6x + 2.7x = 15.5

Hence. Reqd. percentage $= \frac{15.5\ x}{20x} \times 100 = 77.5\%$

Therefore, option (A) is correct.

7. As QR || SV, RU || PS and QT || PV, ΔPQR ~ ΔPSV,
ΔRUV ~ ΔPSV amd ΔQST ~ ΔPSV
As Q divides PS in the ratio of 3 : 1, we have

$\therefore \frac{PQ}{PS} = \frac{3}{4}$

$\therefore \frac{\text{Area of } \Delta PQR}{\text{Area of } \Delta PSV} = \left(\frac{3}{4}\right)^2$

Area of $\Delta PQR = \frac{9}{16} \times$ Area of $\Delta PSV = 2700$ sq. m.

Similarly, lawn area

$= \frac{1}{16} \times$ Area of $\Delta PSV = 300$ sq. m.

Similarly, parking area

$= \frac{1}{16} \times$ Area of $\Delta PSV = 300$ sq. m.

$\therefore$ Remaining or swimming pool area = 4800 – 3300 = 1500 sq. m.

Hence, option A is correct.

8. In such a problem, it is convenient to work backwards.
Let there be x sweets left after the fourth son took his sweets.

Before the third son took his sweets, there were $\frac{4x}{3} + 3$

Before the second son took his Sweets, there were $\left(\frac{4}{3}\right)\left(\left(\frac{4x}{3}\right) + 3\right) + 2$

$= \frac{16}{9}x + 6$

Before the first son took his Sweets, there were $\left(\frac{4}{3}\right)\left(\left(\frac{16}{9}\right)x + 6\right) + 1$

$\frac{64}{27}x + 9 = y$ (Say)

If x = 0 then y = 9. But as each son (and hence the 4th son) got at least 3 sweets, x = 27 and y = 73
Hence, option (E) is correct.

9. This question is based on Apollonius theorem.

In any Δ ABC, if AD is the median on BC, then

$AB^2 + AC^2 = 2 \times (AD^2 + BD^2)$

$\therefore AB^2 + AC^2 = 2 \times (AD^2 + BD^2)$

But, AD = EC

$\therefore AB^2 + AC^2 = 2 \times (EC^2 + DC^2) = DE^2 + FE^2$

$\therefore 25 + 25 = 49 + FE^2$

$\therefore FE = 1$ cm

Hence, option (C) is correct.

---

10. If Kohli gives to Jadeja one-third of what he has, the quantity (or number) with Jadeja gets multiplied by 4/3 or the initial quantity is 3/4 of the final.

As the transaction takes place twice for each person and since the final number with all is the same, it will be convenient to take the final number as 64. (16 will lead to fractional values).

We can tabulate the number of autographs with Kohli, Jadeja, Raina at the 4 stages. We start at the bottom and work upward.

	Kohli	Jadeja	Raina
Initial	75	63	54
After A gives	36	84	72
After B gives	48	48	96
After C gives	64	64	64

The ratio of the number of autographs with Kohli, Jadeja, Raina at the beginning is 75 : 63 : 54 Or 25 : 21 : 18

Alternative solution:

The choices (A) through (D) can each be considered and the question can be solved by the substitution and elimination approach.

Hence, option (A) is correct.