# Maths Questions for CLAT Exam.

## CLAT Maths Quiz 2

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

**1. In a class, there are 32 boys and 28 girls. The average age of the boys in the class is 14 years and the average age of the girls in the class is 13 years. What is the average age of the whole class ? (rounded off to two digits after decimal)**

A. 13.50 B. 13.53 C. 12.51 D. 13.42

**2. A circle of radius 10 cm has an equilateral triangle inscrisbed in it. the length of the perpendicular drawn from the centre to any side of the triangle is**

A. 2.5 √3 cm B. 5√3 cm C. 10√3 cm D. None of these

**3. Three solid of cubes of sides 1cm, 6cm and 8 cm are melted to form a new cube. Find the total surface area of the cube so formed.**

A. 128 $cm^2$ B. 346 $cm^2$ C. 486 $cm^2$ D. 524 $cm^2$

**4. The angles of depression of two ships from the top of a light house are 45° and 30° towards east. If the ships are 200 m apart, find the height of the light house.**

A. 100 m B. 173 m C. 200 m D. 273 m

**5.** $\frac{4+4\times 18-6-8}{123\times 6-146\times 5}$ **= ?**

A. 1 B. 2 C. 6.65 D. 7.75

**6. A group of some boys and girls contributed some money for a picnic. The money contributed by each boy equal to two times of the number of students and the money contributed by each girl was equal to number of boys. In this way, they contributed Rs. 1988. If the number of girls is 5 then find the number of boys?**

A. 33 B. 36 C. 31 D. 28

**7. In an examination, 30% of the total students failed in Hindi, 45% failed in English and 20% failed in both the subjects. Find the percentage of those who passed in both subjects.**

A. 35.7% B. 35% C. 40% D. 45%

**8. In a trapezium, the two non-parallel sides are equal in length, each being of 5 cm. The parallel sides are at a distance of 3 cm apart. If the smaller side of the parallel sides is of length 2 cm, then the sum of the diagonals of the trapezium is**

A. 105 cm B. 65 cm C. 35 cm D. 55 cm

**9. The minute hand of a clock overtakes the hours hand at intervals of 63 min of the correct time. How much does a clock gain or lose in a day?**

A. $56\frac{9}{77}$ min  B. $56\frac{8}{77}$ min  C. $59\frac{8}{77}$ min  D. $56\frac{8}{67}$ min

**10. There are two inlet pipes M and N and one outlet pipe O. M and N alone can empty the tank in 15 min and 12 min respectively. All the three pipes are opened at an interval of 1 min starting with pipe M, then N and then O. If total time taken to empty the completely – filled tank is 4 min 10 sec and capacity of tank is 72 L, then find outlet flow rate of pipe O.**

A. 15 L/min.  B. 18 L/min.  C. 20 L/min.  D. 24 L/min.

**Correct Answers:**

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



## Explanations:

**1.** The average age of the boys = 14 years

The sum of ages of the boys = 14 × 32 = 448 years

The average age of the girls = 13 years

The sum of ages of the girls = 13 × 28 = 364 years

The sum of ages of the boys and the girls = 448 + 364 = 812 years

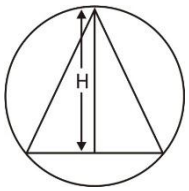
Total students in the class = 32 + 28 = 60

∴ Required average = $\frac{812}{60}$ = 13.53 years

Hence, option (B) is correct.

## 2.

Circum radius = $\frac{2}{3}$ × Height




∴ Height = $\frac{10 \times 3}{2}$ = 15 cm

So, length of perpendicular drawn from center = 15 – 10 = 5 cm.
Hence, option D is correct.

## 3.

Volume of new cube = $(1^3 + 6^3 + 8^3)$ cm$^3$ ⇒ 729 cm$^3$

Edge of new cube = $\sqrt[3]{729}$ cm ⇒ 9cm.

∴ Total surface area of the new cube = $(6 \times 9 \times 9)$ cm$^2$ ⇒ 486 cm$^2$.

Hence, option C is correct.

## 4.

Given, $\angle ACB = 45°$

$\angle ADB = 30°$

and distance between two ships, *i.e.,*

$CD = 200$ m

Then, $AB = ?$

Let $BC = x$ m

In $\Delta ABC$, $\tan 45° = \frac{AB}{BC}$

$1 = \frac{AB}{x}$ ($\because \tan 45° = 1$)

∴ $AB = x$ m ...(i)

In $\Delta ABD$, $\tan 30° = \frac{AB}{BD}$

∴ $\frac{1}{\sqrt{3}} = \frac{AB}{x+200}$ ($\because \tan 30° = \frac{1}{\sqrt{3}}$)

$x = \sqrt{3}AB - 200$ ...(ii)

From Eqs. (i) and (ii),

$AB = \sqrt{3}AB - 200$

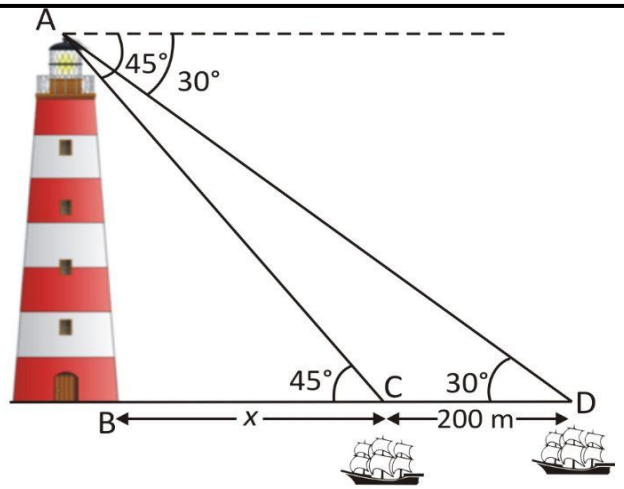
$\sqrt{3}AB - AB = 200$

$0.732\ AB = 200$ ($\because \sqrt{3} = 1.732$)

$AB = \frac{200}{0.732} = 273.22$

$\approx 273$ m

Hence, option D is correct.



**5.** By the applying BODMAS rule, we get

Given expression = $\frac{4 + 72 - 6 - 8}{738 - 730} \Rightarrow \frac{76 - 14}{8}$.

$\Rightarrow \frac{62}{8} \Rightarrow 7.75$.

Hence, option D is correct.

---

**6.** Let the total number of students = x then the number of boys = x – 5

The money contributed by each boy = 2x

The money contributed by all the boys together = $2x \times (x - 5) = 2x^2 - 10x$

The money contributed by each girl = x – 5 = number of boys

The money contributed by all the girls together = 5(x – 5) = 5x – 25

According to question, $2x^2 - 10x + 5x - 25 = 1988$,

$2x^2 - 5x - 25 - 1988 = 0$,

$2x^2 - 5x - 2013 = 0$

By solving, x = – 30.5 or 33

Negative value is not possible so x = 33

The number of boys = 33 – 5 = 28

Hence, option D is correct.



---

**7.** To solve this question, we can apply a short trick approach;

**In an examination x% failed in A and y% failed in B. If z% of students failed in both the subjects, the percentage of students who passed in both the subjects is 100 – (x + y – z).**

Given,

In first subject failed students = x = 30%, In second subject failed students = y = 45%

In both subject failed students = z = 20%

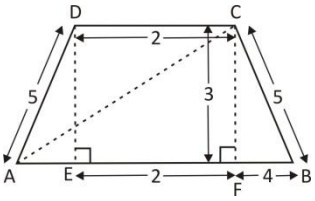
By the short trick approach, we get

100 – (x + y – z) = 100 – (30 + 45 – 20)

= 100 – (55) = 45%.

Hence, option D is correct.

**8.** In ΔBCF,




By the Pythagoras theorem,
$BF^2 = BC^2 - CF^2$
$(BF)^2 = (5)^2 - (3)^2 \Rightarrow BF = 4$ cm
$\therefore$ AB = 2 + 4 + 4 = 10 cm
Now, in ΔACF,
$AC^2 = CF^2 + FA^2 \Rightarrow AC^2 = 3^2 + 6^2$
AC = √45 cm
Similarly, BD = √45 cm
$\therefore$ Sum of diagonal = 2 × √45 = 2 × 3√5 = 6√5 cm.
Hence, option B is correct.

---

**9.** Given that x = 63 min
Then, according to formula,
The required result = $\left(\frac{720}{11} - x\right)\left(\frac{60 \times 24}{x}\right)$ min

$= \left(\frac{720}{11} - 63\right)\left(\frac{60 \times 24}{63}\right)$ min $= \frac{27}{11} \times \frac{60 \times 8}{21} = 56\frac{8}{77}$ min

As result is positive, therefore the clock gains $56\frac{8}{77}$ min

**Aliter**
As we know thats in a correct clock, the min hands gain 55 min spaces over the hour hands in 60 min.
To be together again, the minute hand must gain 60 min over the hour hand.
$\therefore$ 55 min are gained in $\left(\frac{60}{55} \times 60\right)$min $= \frac{5}{11}$ min
But they are together after 63 minute.
$\because$Gain in 63 min $= \left(65\frac{5}{11} - 63\right) = 2\frac{5}{11}$ min $= \frac{27}{11}$ min
As result is negative, therefore
Gain in 24 h (one day) $= \left(\frac{27}{11} \times \frac{60 \times 24}{63}\right)$ min $= \frac{4320}{77}$ min $= 56\frac{8}{77}$ min

As the result is positive, therefore
the clock gain $56\frac{8}{77}$ min
Hence, option B is correct.

**10.**

Time for which pipe M is opened = 4 min 10 sec = $\frac{25}{6}$ min.

Time for which pipe N is opened = $\frac{25}{6} - 1 = \frac{19}{6}$ min.

Time for which pipe O is opened = $\frac{25}{6} - 2 = \frac{13}{6}$ min.

Let pipe O alone can empty the tank in 'T' min.

$\Rightarrow \frac{\frac{13}{6}}{T} = \frac{\frac{25}{6}}{15} + \frac{\frac{19}{6}}{12}$

$\Rightarrow \frac{13}{6T} = \frac{5}{18} + \frac{19}{72}$

$\Rightarrow \frac{13}{6T} = \frac{20 + 19}{72}$

$\Rightarrow \frac{13}{6T} = \frac{39}{72}$

$\Rightarrow T = \frac{13 \times 72}{39 \times 6}$

$\Rightarrow T = 4$ min

Outlet flow rate of pipe O = $\frac{72}{4}$ = 18 L/min.

Hence, option B is correct.