

LDC (RD) Maths Solved. (25.03.2023)



Frank's School of Maths -

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1. A man has some hens and cows. If the number of heads be 48 and the number of feet equals 140, then the number of hens will be-

Sol:- Hens = x , Cows = y .

$$\text{Then, } x + y = 48 \text{ (Heads)}$$

$$2x + 4y = 140 \text{ (Feet)}$$

$$\text{So, } \cancel{x} + y = 48$$

$$\begin{array}{r} \cancel{x} + 2y = 70 \\ \hline \end{array}$$

$$-y = -22$$

$$y = 22$$

$$\text{Now, } x + 22 = 48$$

$$\Rightarrow x = 48 - 22 = \boxed{26}$$

2. A library has an average of 510 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is -

Sol:- If a month starts with Sunday, then the number of Sundays in that month is 5
The remaining days is $30 - 5 = 25$.

$$\text{Then, } \frac{\text{Visitors on Sundays}}{5} = 510$$

$$\Rightarrow \text{Visitors on Sundays} = 510 \times 5 \\ = 2550$$

$$\text{And, } \frac{\text{visitors on other days}}{25} = 240$$

$$\Rightarrow \text{Visitors on other days} = 240 \times 25 \\ = 6000$$

$$\therefore \text{Total average} = \frac{2550 + 6000}{30}$$

$$= \frac{8550}{30} = \boxed{285}$$

3. The shopkeeper professes to sell his article at a discount of 10% but increases the cost price of each article by 20%. His gain on each article is -

Sol:- let CP = ₹100.

$$\begin{aligned} \text{Then, MP at 20\% up} &= \frac{(100 + 20)}{100} \times 100 \\ &= ₹120. \end{aligned}$$

$$\text{So, SP} = (100 - k)\% \text{ MP}$$

$$\Rightarrow \text{SP} = \frac{(100 - 10)}{100} \times 120 = \frac{90}{100} \times 120$$

$$\Rightarrow \text{SP} = ₹108.$$

$$\text{Gain \%} = \frac{(108 - 100)}{100} \times 100$$

$$= \boxed{8\%}$$

4. Three candidates contested in an election and received 1136, 7636 and 11628 votes respectively. What percent of the total votes did the winning candidate get?

Sol:- Total votes = $1136 + 7636 + 11628$
 $= 20400$

$$\therefore \% = \frac{11628}{20400} \times 100 = \boxed{57\%}$$

5. The population of a town increased from 175000 to 262500 in a decade. The average percent increase of population per year is-

Sol:- $\% \text{ inc} = \frac{(262500 - 175000)}{175000} \times 100$
 $= 50\% \text{ (decade)}$

Average percent increase per year

$$= \frac{50}{10} \% = \boxed{5\%}$$

6. In a mixture of 60 litres, the ratio of milk and water is 2:1. If this ratio is to be 1:2, then the quantity of water to be further added is-

$$\text{Sol:- Milk} = \frac{2}{3} \times 60 = 40L, \quad \text{Water} = \frac{1}{3} \times 60 = 20L$$

$$\text{Then, } \frac{40}{20 + x} = \frac{1}{2}$$

$$\Rightarrow 40 \times 2 = 20 + x$$

$$\Rightarrow x = 80 - 20 = \boxed{60L}$$

7. In a dairy farm, 40 cows eat 40 bags of husk in 40 days. In how many days one cow will eat one bag of husk?

$$\text{Sol:- } M_1 D_1 W_2 = M_2 D_2 W_1$$

$$\Rightarrow 40 \times 40 \times 1 = 1 \times D_2 \times 40$$

$$\Rightarrow \frac{40 \times 40}{40} = D_2$$

$$\Rightarrow D_2 = \boxed{40 \text{ days}}$$

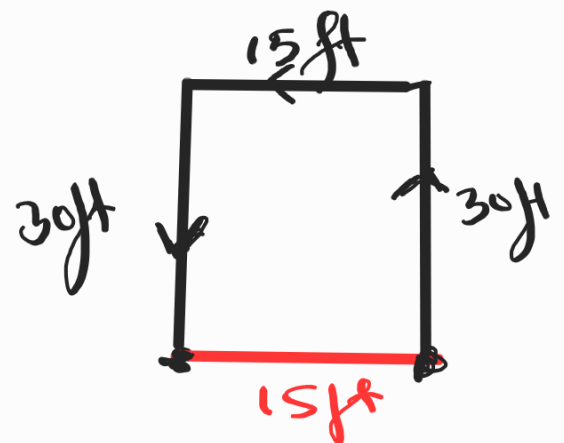
8. A person crosses a 600 m long street in 5 minutes. What is his speed in km/hr?

Sol:-
$$S = \frac{D}{t} = \frac{600 \text{ m}}{(5 \times 60) \text{ sec}}$$
$$= \frac{600}{300} = 2 \text{ m/s} = 2 \times \frac{18}{5} \text{ km/hr}$$
$$= \boxed{7.2 \text{ km/hr}}$$

9. Bhairav walked 30 ft towards North, then took a left turn and walked 15 ft. He again took a left turn and walked 30 ft. How far and in which direction is Bhairav from the starting point?

Sol:-

15 ft to the West
from the starting
point.



10. How much time will it take for an amount of Rs. 450 to yield Rs. 81 as interest at 4.5% per annum of simple interest?

Sol:- $S.I = \frac{Prt}{100}$

$$\Rightarrow 81 = \frac{450 \times 4.5 \times t}{100}$$

$$\Rightarrow \frac{81 \times 100}{450 \times 4.5} = t$$

$$\Rightarrow \frac{\cancel{81} \times \cancel{100} \times \cancel{10}^2}{\cancel{450} \times \cancel{45}^2} = t$$

$$\Rightarrow t = \frac{20}{5} = \boxed{4 \text{ yrs}}$$

11. How many bricks each measuring 0.25 m x 0.1125 m x 0.06 m, will be needed to build a wall of 8m x 6m x 0.225m?

Sol:- No. of bricks

$$\begin{aligned} & 8 \times 6 \times 0.225 \\ = & \frac{0.25 \times 0.1125 \times 0.06}{8 \times 6 \times 225 \times 100 \times 10000 \times 100} \\ = & \frac{25 \times 1125 \times 6 \times 1000}{8 \times 4 \times 200} = \boxed{6400} \end{aligned}$$

12. What will be the perimeter of a rectangular garden having a length of 15 m and width of 10 m?

Sol:- $P = 2(l+b) = 2(15+10)$

$$\Rightarrow P = 2 \times 25 = \boxed{50 \text{ m}}$$

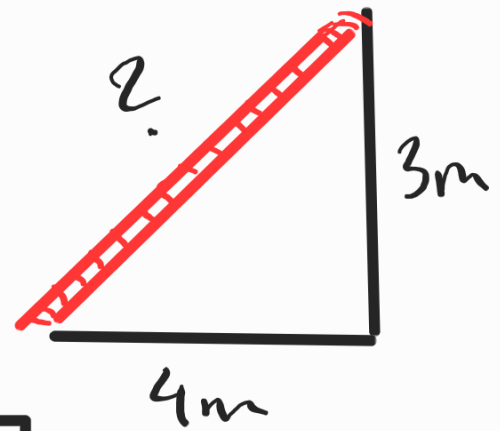
13. The height of the wall is 3 m where a ladder is leaning on it and the foot of the ladder is 4 m away from the wall. The length of the ladder is-

Sol:- By Pythagoras' theorem,

$$?^2 = 3^2 + 4^2$$

$$?^2 = 9 + 16$$

$$? = \sqrt{25} = \sqrt{5^2} = \boxed{5\text{m}}$$

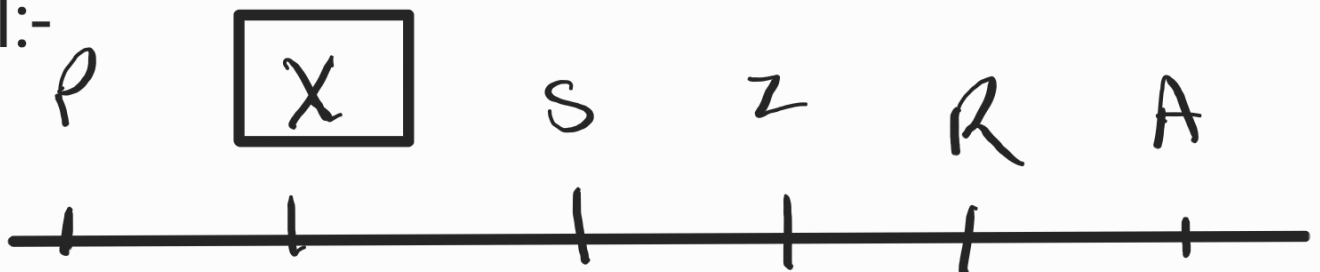


14. The point (0,0) lies at-

Sol:- *The origin.*

15. A, P, R, X, S and Z are sitting in a row. S and Z are in the center, and A and P are at the ends. R is sitting on the left of A. Then who is on the right of P?

Sol:-



16. Which of the following is the largest number?

(a) 1111.01 (b) 1111.001 (c) 111.11

(d) 1111.1

17. The sum of the natural numbers which are divisors of 100, is-

Sol:- The natural nos which can divide 100 are

1, 2, 4, 5, 10, 20, 25, 50, 100

$$\begin{aligned} \text{Sum} &= 1 + 2 + 4 + 5 + 10 + 20 \\ &\quad + 25 + 50 + 100 \end{aligned}$$

$$= \boxed{217}$$

18. Simplify $4 - [6 - \{12 - (10 - \overline{(8 - 6)})\}]$

Sol:- $4 - [6 - \{12 - (10 - 2)\}]$

$$= 4 - [6 - \{12 - 8\}]$$

$$= 4 - [6 - 4]$$

$$= 4 - 2 = \boxed{2}$$

19. Which of the following is not a perfect cube?

(a) 4913 (b) 12167 (c) 64 (d) 3374

Sol:- $\sqrt[3]{4913} = \sqrt[3]{17^3} = 17$ (Perfect cube)

$$\sqrt[3]{12167} = \sqrt[3]{23^3} = 23 \text{ (")}$$

$$\sqrt[3]{64} = \sqrt[3]{4^3} = 4 \text{ (")}$$

Only 3374 is not a perfect cube.

20. In how many ways the letters of the word STRESS can be arranged?

Sol:-

$$\text{Ways} = \frac{6!}{3!} = \frac{6 \times 5 \times 4 \times 3!}{3!}$$

$$= 6 \times 5 \times 4 = \boxed{120}$$

21. $\frac{\sqrt{24} + \sqrt{216}}{\sqrt{96}} = ?$

Sol:-

$$\frac{\sqrt{2^2 \times 2 \times 3} + \sqrt{2^2 \times 3^2 \times 2 \times 3}}{\sqrt{2^2 \times 2^2 \times 2 \times 3}}$$

$$= \frac{2\sqrt{6} + 2 \times 3\sqrt{6}}{2 \times 2\sqrt{6}}$$

$$= \frac{8\sqrt{6}}{4\sqrt{6}} = \frac{8}{4}$$

$$= \boxed{2}$$

$$\begin{array}{r} 2 \overline{)24} \\ \underline{20} \\ 4 \\ \underline{4} \\ 0 \end{array}$$

$$\begin{array}{r} 2 \overline{)216} \\ \underline{20} \\ 10 \\ \underline{10} \\ 6 \\ \underline{6} \\ 0 \end{array}$$

$$\begin{array}{r} 2 \overline{)96} \\ \underline{20} \\ 18 \\ \underline{16} \\ 2 \\ \underline{2} \\ 0 \end{array}$$

22. The average of 50 boys is 13 years. The average age of the first 30 boys is 15 years. Find out the average age of the remaining 20 boys.

$$\text{Sol:- } \frac{x_1 + \dots + x_{50}}{50} = 13$$

$$\Rightarrow x_1 + \dots + x_{50} = 13 \times 50 = 650$$

$$\text{Then, } \frac{x_1 + \dots + x_{30}}{30} = 15$$

$$\Rightarrow x_1 + \dots + x_{30} = 15 \times 30 = 450$$

$$\begin{aligned} \text{Average of remaining} \\ &= \frac{650 - 450}{20} = \frac{200}{20} \end{aligned}$$

$$= \boxed{10 \text{ yrs}}$$

23. A dealer purchased a washing machine for Rs. 12000. He allows a discount of 12% on its marked price and still gains 10%.

Find the marked price of the machine.

Sol:- $SP = \frac{(100 - 12)}{100} MP$

$$\Rightarrow \underline{SP} = \frac{88}{100} MP.$$

And, $SP = \frac{(100 + 10)}{100} CP$

$$\Rightarrow SP = \frac{11}{10} \times 12000 = ₹ 13200$$

$$\therefore 13200 = \frac{88}{100} MP$$

$$\Rightarrow 13200 \times \frac{100}{88} = MP$$

$$\Rightarrow MP = \boxed{₹ 15000}$$

24. The salary of an LDC in RD department is increased by 20%. By what percent must the increased salary be reduced in order to restore it to the former amount?

Sol:- Suppose initial salary = ₹ 100

$$\text{Increased salary} = \frac{(100+20)}{100} \times 100$$

$$= ₹ 120$$

$$\% = \frac{(120-100)}{120} \times 100$$

$$= \frac{\cancel{20}}{\cancel{120} \times 3} \times \cancel{100} \times 50 = \frac{50}{3} \%$$

$$= \boxed{16 \frac{2}{3} \%}$$

$$\begin{array}{r} 16 \\ 3 \overline{) 50} \\ \underline{48} \\ 20 \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array}$$

25. On selling an article for Rs. 42500, a dealer loses 15%. For how much should it be sold to gain 25%?

$$\text{Sol:- } SP = \frac{(100 - 15)}{100} \times CP$$

$$\Rightarrow 42500 = \frac{85}{100} CP$$

$$\Rightarrow CP = \frac{42500 \times 100}{85} = ₹ 50000$$

$$\text{Then, } SP = \frac{(100 + 25)}{100} CP$$

$$\Rightarrow SP = \frac{125}{100} \times 50000$$

$$\Rightarrow SP = \boxed{₹ 62500}$$
