

LAKSHYA ACADEMY

**SAINIK SCHOOL | MILITARY SCHOOL | RIMC [ONLINE & OFFLINE]
JAIPUR(RAJ.) [9636961534] | PATNA(BIHAR) [8426961534]**

PRACTICE SET - 1

NAME : _____

DATE : ___/___/_____

1. Find the least multiple of 23, which when divided by 18, 21 and 24 leaves the remainder 7, 10 and 13 respectively.
2. Find the value of x if $99x = (76)^2 - (67)^2$
3. Divide $2x^3 - 2x - x^2 - 7$ by $(-2 + x)$.
4. The ratio between a two-digit number and the sum of the digits of that number is 4:1. If the digit at the unit's place is 3 more than the digit at the ten's place, then the number is
5. If 8 men can reap 80 hectares in 24 days, how many hectares can 36 men reap in 30 days.
6. The sum of the age of a father and his son is 100 years now. 5 years ago their age were in the ratio of 2:1. The ratio of the age of father and son after 10 years will be
7. If A exceeds B by 60% and B is less than C by 20%, then A:C is
8. The average of first and second number is 25 more than the average of the second and third number. Find the difference between the first and the third number.
9. Evaluate: $(1^3 + 2^3 + 3^3 + 4^3)^{-\frac{3}{2}}$
10. Due to bad road, the speed of a tourist bus is reduced by 12 km/hr and it now takes $2\frac{1}{2}$ hours more to cover the same distance of 600 km. Find the time it now takes to cover the distance.
11. A man can row 5 kmph in the still water. If the river is running at 2 kmph, it takes him 5 hours to row up to a place and come down. How far is the place?
12. If $x + y = 9$ and $xy = 16$, find (i) $x^2 + y^2$ (ii) $(x - y)^2$
13. From a number of apples, a man sells half the number of existing apples plus 1 to the first customer, sells $\frac{1}{3}$ rd of the remaining apples plus 1 to the second customer and $\frac{1}{5}$ th of the remaining apples plus 1 to the third customer. He then finds that he has 3 apples left. How many apples did he have originally?
14. x and y can do a job in 15 days and 10 days respectively. They began the work together but x leaves after some days and y finishes the remaining job in 5 days. After how many days did x leave?
15. Find the value of x if $2^{x+1} + 3 \cdot 2^{x-3} = 76$

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16. A train 110m long travels at 60 kmph. How long does it take to cross:

- (a) a lamp post
- (b) a dog running at 6kmph in the direction of train.
- (c) a dog running at 6kmph in the opposite direction of train.
- (d) a bridge 240m long.
- (e) another stationary train 170m in length.
- (f) another train of length 170m running at 54 kmph in the same direction.
- (g) another train of length 170m running at 80 kmph in the opposite direction.

17. Factorize: $x^3 - \frac{1}{x^3} - 2x + \frac{2}{x}$

18. Two pipes can fill a cistern in 6 minutes and 7 minutes respectively. Both the pipes are opened alternatively for 1 minute each. In what time will they fill the cistern.

19. Solve; $\frac{1}{x-1} + \frac{3}{x+1} = \frac{4}{x}$

20. The least number that should be subtracted from the number 32146 to make it a perfect square is

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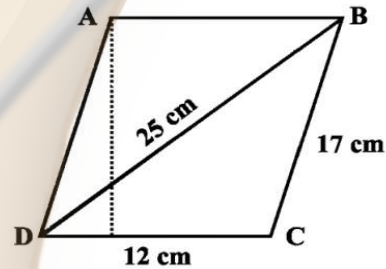
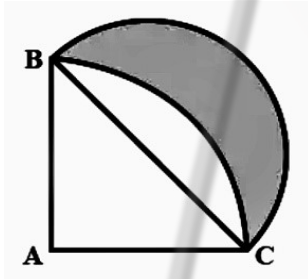
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1. If its perimeter of an equilateral triangle is 180 cm, what will be its area?
2. The length of a hall is 20 m and width 16 m. The sum of the areas of the floor and the flat roof is equal to the sum of the areas of the four walls. Find the height and the volume of the hall.
3. The length circle is 8 cm and perpendicular distance between centre and the chord is 3 cm. Then the radius of the circle is equal to of the chord of a
4. In Fig., ABC is a quadrant of a circle of radius 14cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region



5. Find the area of a parallelogram given in the above right sided Figure. Also find the length of the altitude from vertex A on the side DC.
6. The perimeter of a rectangle is 160 meter and the difference of two sides is 48 metre. Find the side of a square whose area is equal to the area of this rectangle
7. A wire when bent in the form of a square encloses an area of 484 sq. cm. What will be the enclosed area, When the wire is bent into the form of a circle?
8. The adjacent sides of a parallelogram 36 cm and 27 cm in length. If the perpendicular distance between the shorter sides is 12 cm, find the distance between the longer sides.
9. A solid cylinder has total surface area of 462cm^2 . Its curved surface area is one-third of its total surface are. Find the volume of the cylinder
10. If the areas of three consecutive faces of a cuboid are 12 cm^2 , 20 cm^2 , and 60 cm^2 , then the volume (in cm^3) of the cuboid is
11. The volume of a metallic cylindrical pipe is 748 cm^3 . Its length is 14 cm and its external radius is 9 cm. Find its thickness.

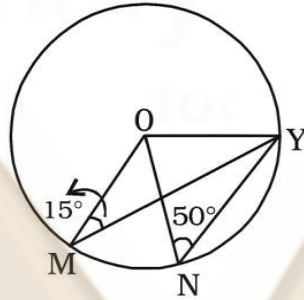
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12. Two regular polygons are such that the ratio between their number of sides is 1:2 and the ratio of measures of their interior angles is 3:4. Then the number of sides of each polygon is

13. In the given figure, $\angle ONY = 50^\circ$ and $\angle OMY = 15^\circ$. Then the value of the $\angle MON$ is



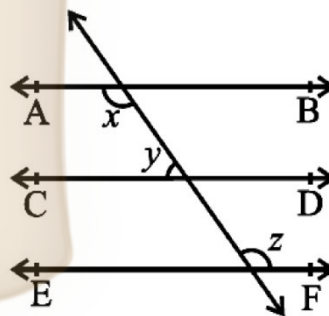
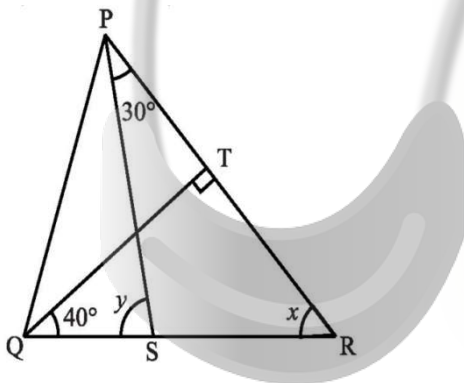
14. Two angles of triangle are equal and the third angle is greater than each of these angles by 30° . Find all the angles of the triangle.

15. A metallic cube of edge 2.5 cm is melted and recasted into the form of a cuboid of base 1.25 cm \times 0.25 cm. Find the increase in the surface area.

16. Construct a triangle ABC in which $BC = 7\text{cm}$, $\angle B = 75^\circ$ and $AB + AC = 13\text{ cm}$

17. Water is flowing at the rate of 5 km/hr through a cylindrical pipe of diameter 14 cm into a rectangular tank which is 50 m long and 44 m wide. Determine the time in which the level of water in the tank will raise by 7 cm.

18. In the below left sided figure, if $QT \perp PR$, $\angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$, find x and y .



19. In the below left figure, if $AB \parallel CD$, $CD \parallel EF$ and $y : z = 3 : 7$, find x .

20. The perimeter of two squares is 40 cm and 32 cm. The perimeter of a third square whose area is the differences of the two squares is

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1. When a number is divided by 56, the remainder obtained is 29. What will be the remainder when the number is divided by 8?
2. Buy 1 get 3 free. What is the discount percent that is being offered here?
3. Rajesh has to score 20% marks to pass in a test. If he gets 60 marks and fails by 40 marks, then find the total marks assigned for the test?
4. In a farm there are cows and hens. If heads are counted they are 180, if legs are counted they are 420. The number of cows in the farm is
5. If 42 persons consume 144 kg of wheat in 15 days, then in how many days will 30 persons consume 45 kg of wheat?
6. If the digit of a two-digit number is interchanged the newly formed number is more than the original number by 18 and sum of the digit is 8, then the original number is
7. The greatest number which can divide 110 and 128 leaving the same remainder 2 in each case, is-
8. If $2P + \frac{1}{P} = 4$. Find the value of $P^3 + \frac{1}{8P^3}$
9. A batsman in his 16th innings makes a score of 92 and thereby increases his average by 4. What is his average after 19 innings?
10. The ratio of the ages of A and B at present is 5:3. After 7 years the ratio will become 3:2. What is the sum of the present ages of A and B?
11. Ratnesh sold a watch at a loss of 5%. Had he sold it for Rs. 49 more, he would have gained 2%. Find the cost price.
12. $\frac{3^{n+4} - 2(2^n)}{2(2^{n+3})} + 2^{-3}$ is equal to-
13. The solution for $\frac{2}{x+3} - \frac{4}{x-3} = \frac{-6}{x+3}$ is:
14. What must be added to $x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is exactly divisible by $x^2 + 2x - 3$

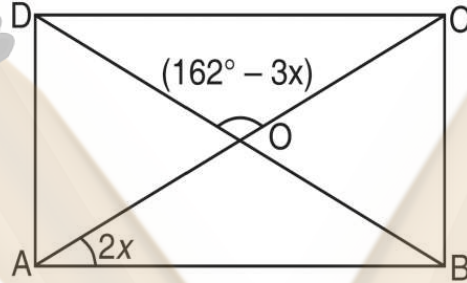
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15. A train X starts from New Delhi at 4 pm and reaches Ghaziabad at 5 pm. While another train Y starts from Ghaziabad at 4 pm and reaches New Delhi at 5:30 pm. At what time will the two trains cross each other?

16. ABCD is a rectangle. Find x.

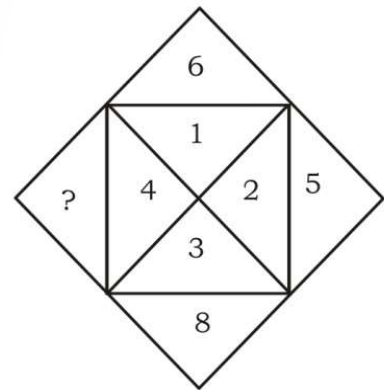


17. A profit of Rs 6000 is to be distributed among A, B and C in the ratio 3:4:5 respectively. How much more will C get than B?

18. What per cent of numbers from 1 to 70 have squares that end in the digit 1?

19. Find the value of missing number(?) in left sided figure.

5	8	14
9	6	21
7	2	?



20. Find the value of missing number(?) in right sided figure.

21. A well 20 m in diameter is dug 14 m deep and the earth taken out is spread all round it to a width of 5 m to form an embankment. The height of the embankment is

22. If 4 men or 6 women can do a piece of work in 12 days working 7 hours a day; how many days will it take to complete a work twice as large with 10 men and 3 women working together 8 hours a day?

23. A motor boat whose speed is 15 km/hr in still water goes 30 km downstream and comes back in 4 hours 30 minutes. Determine the speed of the stream.

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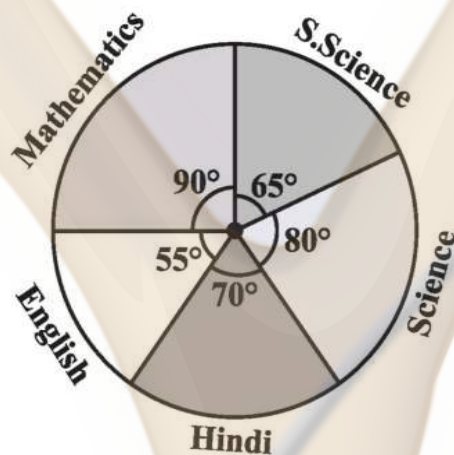
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24. The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social Science and Science. If the total marks obtained by the students were 540, answer the following questions.

(i) In which subject did the student score 105 marks?

(ii) How many more marks were obtained by the student in Mathematics than in Hindi?

(iii) Examine whether the sum of the marks obtained in Social Science and Mathematics is more than that in Science and Hindi.



25. Construct a quadrilateral ABCD in which $AB = BC = 5.5$ cm, $CD = 4$ cm, $DA = 6.3$ cm, $AC = 9.4$ cm Measure BD.

26. A man spends 75% of his income. This income is increased by 20% and he increases his expenditure by 10%. By what per cent are his savings increased?

27. The sum of the length, breadth and depth of a cuboid is 19 cm and the diagonal is $5\sqrt{5}$. Its surface area is

28. Factorize: (i) $2x^2 - \frac{5}{6}x + \frac{1}{12}$ (ii) $x^8 + x^4 + 1$

29. Work done by $(x+4)$ men in $(x+5)$ days is equal to the work done by $(x-5)$ men in $(x+20)$ days. Then the value of x is

30. On what sum does the difference between the compound interest and the simple interest for 3 years at 10% is Rs 31?

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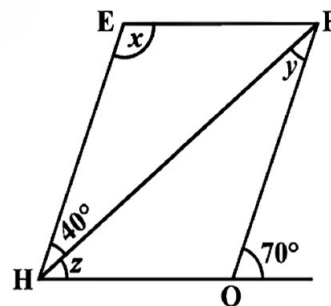
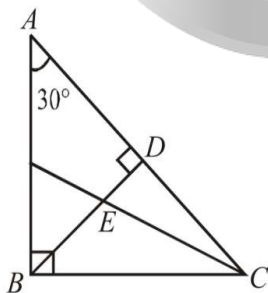
1. Value of $999\frac{995}{999} \times 999 = ?$
2. In an examination, a boy was asked to multiply a given number by $\frac{7}{19}$. By mistake, he divided the given number by $\frac{7}{19}$ and got a result 624 more than the correct answer. The sum of digits of the given number is
3. In a certain party, there was a bowl of rice for every two guests, a bowl of broth for every three of them and a bowl of meat for every four of them. If in all there were 65 bowls of food, then how many guests were there in the party ?
4. If $5a + \frac{1}{3a} = 5$, then the value of $9a^2 + \frac{1}{25a^2}$
5. An employer pays Rs 20 for each day a works, and for feits Rs 3 for each day he is idle. At the end of 60 days, a worker gets Rs 280. For how many days did the worker remain idle?
6. What must be added to each of the four numbers 10, 18, 22, 38 so that they become in proportion ?
7. The difference between the value of a number increased by 25% and the value of the original number decreased by 30% is 22. What is the original number ?
8. 'A' completes a work in 12 days. 'B' completes the same work in 15 days. 'A' started working alone and after 3 days B joined him. How many days will they now take together to complete the remaining work?
9. The greatest number which will divide 116, 221, 356 leaving the same remainder in each case is
10. A train of length 100 m takes $\frac{1}{6}$ hour to pass over another train 150 m long coming from the opposite direction. If the speed of first train is 60 km/h, then find speed of the second train.

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- Four different electronic devices make a beep after every 30 minutes, 1 hour, $1\frac{1}{2}$ hour and 1 hour 45 minutes respectively. All the devices beeped together at 12 noon. They will again beep together at:
- A father told his son, "I was as old as you are at present, at the time of your birth," If the father is 38 years old now, what was the son's age five years back?
- The sum of five consecutive odd numbers is 265. What is the sum of the largest number and twice the smallest number?
- If $a + b + c = 13$, $a^2 + b^2 + c^2 = 69$, then find $ab + bc + ca$.
- How many whole numbers between 100 and 800 contain the digit 2?
- If the perimeter and diagonal of a rectangle are 14 and 5 cms respectively, find its area.
- At a simple interest Rs 800 becomes Rs 956 in three years. If the interest rate, is increased by 3%, how much would Rs 800 become in three years?
- Two equal circles pass through each other's centre. If the radius of each circle is 5 cm, what is the length of the common chord?
- The sum of the interior angles of a polygon is 1440° . The number of Diagonals of the polygon is
- In an Entrance Examination Ritu scored 56 percent marks, Smita scored 92 percent marks and Rina scored 634 marks. The maximum marks of the examination are 875. What are the average marks scored by all the three girls together?
- In $\triangle ABC$, $AB \perp BC$ and $BD \perp AC$. And CE bisects the angle C . $\angle A = 30^\circ$. What is angle $\angle CED$?



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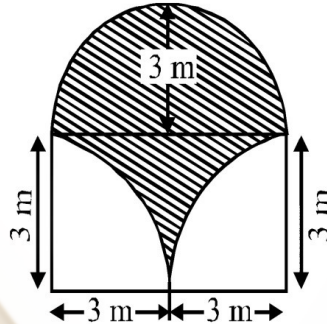
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22. Sanjay donates his one part of the land HOPE in the form of parallelogram to the village children for Hospital. Find x , y and z . Which value is depicted from this?
23. What price should Neha mark on a sari which cost her Rs 3000, so as to gain 20% after allowing a discount of 10%?
24. A sum of money is lent out at compound interest rate of 20 % per annum for 2 years. It would fetch Rs 482 more if interest is compounded half-yearly. Find the sum.
25. A can build up a wall in 8 days while B can break it in 3 days. A has worked for 4 days and then B joined to work with A for another 2 days only. In how many days will A alone build up the remaining part of wall?
26. A boat covers 48 km in upstream and 72 km in downstream in 12 hours, while it covers 72 km in upstream and 48 km in downstream in 13 hours. Find the speed of the stream.
27. Sameer spends 24% of his monthly income on food and 15% on the education of his children. Of the remaining salary, he spends 25% on entertainment and 20% on conveyance. He is now left with Rs. 10,736. What is the monthly income of Sameer?
28. The dimensions of a field are 20 m by 9 m. A pit 10 m long, 4.5 m wide and 3 m deep is dug in one corner of the field and the earth removed has been evenly spread over the remaining area of the field. What will be the rise in the height of field as a result of this operation?
29. Construct a quadrilateral ABCD in which $AB = 4$ cm $BC = 3.8$ cm, $AD = 3$ cm, diagonal $AC = 5$ cm and diagonal $BD = 4.6$ cm.
30. A dealer sold a sofa set at a profit of 18%. Had he sold it for Rs.450 less, he would have gained 12%. For what value should he sell it in order to gain 15%?
31. In the adjoining figure is a park in which shaded area is to be covered by grass. If the rate of covering with grass is Rs 0.70 per sq. m. Find the expenditure of covering its field with grass (Pie = $22/7$)

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32. A passage 12 m long, 3 m high and 4 m wide has two doors of 2.5 m by 1.5 m and a window of 2 m by 0.60 m. The cost of colouring the walls and ceiling at Rs 15 per sq. m is

33. Two trains are moving in opposite direction at the rate of 60 km/hr and 90 km/hr. Their lengths are 1.10 km and 0.9 km respectively. The time taken by the slower train to cross the faster train in seconds is

34. The favourite flavours of ice-creams for students of a school is given in percentages as follows.

- (i) Which flavour got the most percentage?
- (ii) Find the central angle of each sector.
- (iii) Draw a pie chart to show this information.

Flavours	Chocolate	Vanilla	Other flavours
Percentage of students preferring the flavours	50%	25%	25%

35. A rectangular sheet of tin foil of size 30 cm \times 18 cm can be rolled to form a cylinder in two ways along length and along breadth. Find the ratio of volumes of the two cylinders thus formed.

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RASHTRIYA INDIAN MILITARY COLLEGE, DEHRADUN
ENTRANCE EXAMINATION – JUNE 2024
SUBJECT: MATHEMATICS

TIME: 1Hr

MM: 100

Instructions:

1. Attempt all 10 questions. Write your answers separately on the answer sheet to be provided at the exam centre.
2. Paper contains 10 questions and each question carries 'Ten marks.'
3. Use of calculator is prohibited. Marks will be awarded stepwise.
4. Take the value of π as $\frac{22}{7}$
5. Use blue / black ball pen to answer the questions.
6. The question paper can be retained by the candidates post examination.

1. Suppose x and y are real numbers satisfying $x^2 + y^2 - 22x - 20y + 221 = 0$. Find xy . / मान लीजिए x और y वास्तविक संख्याएँ हैं जो $x^2 + y^2 - 22x - 20y + 221 = 0$ को संतुष्ट करती हैं। xy खोजें।

2. Jane has 6 sons and no daughters. Some of her sons have 6 sons, and the rest have none. Jane has a total of 30 sons and grandsons, and no great-grandsons. How many of Jane's sons and grandsons have no sons? / जेन के 6 बेटे हैं और कोई बेटी नहीं है। उनके कुछ बेटों के 6 बेटे हैं, और बाकी के एक भी नहीं है। जेन के कुल 30 बेटे और पोते हैं, और कोई परपोता नहीं है। जेन के कितने पुत्रों और पौत्रों के कोई पुत्र नहीं हैं?

3. Every morning, Aya does a 9 kilometers walk, and then finishes at the coffee shop. One day, she walks at s kilometers per hour, and the walk takes 4 hours, including t minutes at the coffee shop. Another morning, she walks at $s + 2$ kilometers per hour, and the walk takes 2 hours and 24 minutes, including t minutes at the coffee shop. This morning, if she walks at $s + \frac{1}{2}$ kilometers per hour, how many minutes will the walk take, including the t minutes at the coffee shop? / हर सुबह, अया 9 किलोमीटर की सैर करती है और फिर कॉफी शॉप पर खत्म होती है। एक दिन, वह s किलोमीटर प्रति घंटे की गति से चलती है, और चलने में 4 घंटे लगते हैं, जिसमें कॉफी शॉप पर बिताए गए t मिनट भी शामिल हैं। एक और सुबह, वह $s + 2$ किलोमीटर प्रति घंटे की गति से चलती है, और चलने में 2 घंटे और 24 मिनट लगते हैं, जिसमें कॉफी शॉप पर बिताए गए t मिनट भी शामिल हैं। आज सुबह, यदि वह $s + \frac{1}{2}$ किलोमीटर प्रति घंटे की गति से चलती है, तो कॉफी शॉप पर t मिनट सहित, चलने में कितने मिनट लगेंगे?

4. (a) The 9th November 1999 had an unusual feature. If it was written in the form 9/11/99 then it could be seen that $9 \times 11 = 99$. Or, in words: day \times month = year (Last two digits). What is the first date in this new century that this will happen? 9 नवंबर 1999 की घटना में एक असामान्य विशेषता थी। यदि इसे 9/11/99 के रूप में लिखा जाए तो यह देखा जा सकता है कि $9 \times 11 = 99$. अथवा, शब्दों में: दिन \times माह = वर्ष (अंतिम दो अंक)। इस नई सदी में ऐसा पहली तारीख कौनसी होगी जब ऐसा होगा?

(b) A 'Harshad number' has been defined as a number which can be divided exactly by the sum of its digits. For example: 1729 is a Harshad number since $1 + 7 + 2 + 9 = 19$ and 1729 can be divided exactly by 19. Find the smallest Harshad number which is divisible by 13. / 'हर्षद संख्या' को एक ऐसी संख्या के रूप में परिभाषित किया गया है जिसे उसके अंकों के योग से विभाजित किया जा सकता है। उदाहरण के लिए: 1729 एक हर्षद संख्या है क्योंकि $1+7+2+9=19$ और 1729 को ठीक 19 से विभाजित किया जा सकता है। सबसे छोटी हर्षद संख्या ज्ञात कीजिए जो 13 से विभाज्य हो।

5. In one class in the school, number of absent students is $\frac{1}{6}$ of number of students who were present. When teacher sent one student to bring chalk, number of absent students was $\frac{1}{5}$ of number of students who were present. How many students are in that class? / स्कूल की एक कक्षा में, अनुपस्थित छात्रों की संख्या उपस्थित छात्रों की संख्या का $\frac{1}{6}$ है। जब शिक्षक ने एक छात्र को चॉक लाने के लिए भेजा, तो अनुपस्थित छात्रों की संख्या उपस्थित छात्रों की संख्या का $\frac{1}{5}$ थी। उस कक्षा में कितने छात्र हैं?

"LIFE IS TOO SHORT TO WAIT"

LAKSHYA ACADEMY

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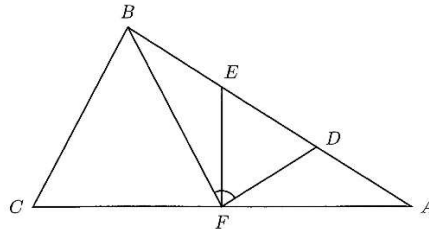
6. Four girls at the back of the classroom were comparing the numbers of prizes they had won at the fair. "I've got one more than you", said Bernice. "I've got two more than you", said one girl to another. "I've got three more than you" said one to another. "I've got four more than you", "I've got five more than you", "I've got six more than you", rang their excited voices, but we don't know who was talking to whom. If they had won a total of 27 prizes, how many did Bernice win? / कक्षा के पीछे चार लड़कियाँ मेले में जीते गए पुरस्कारों की संख्या की तुलना कर रही थीं। बर्निस ने कहा, "मेरे पास आपके जैसा एक और है।" एक लड़की ने दूसरी से कहा, "मेरे पास तुमसे दो ज्यादा हैं।" एक ने दूसरे से कहा, "मुझे तुमसे तीन अधिक मिले हैं।" "मुझे आपसे चार अधिक मिले हैं", "मुझे आपसे पाँच अधिक मिले हैं", "मुझे आपसे छह अधिक मिले हैं", उनकी उत्साहित आवाजें सुनाई दीं, लेकिन हम नहीं जानते कि कौन किससे बात कर रहा था। यदि उन्होंने कुल 27 पुरस्कार जीते, तो बर्निस ने कितने पुरस्कार जीते?

7. Among the 900 residents of Aimeville, there are 195 who own a diamond ring, 367 who own a set of golf clubs, and 562 who own a garden spade. In addition, each of the 900 residents owns a bag of candy hearts. There are 437 residents who own exactly two of these things, and 234 residents who own exactly three of these things. Find the number of residents of Aimeville who own all four of these things. / ऐमविले के 900 निवासियों में से 195 ऐसे हैं जिनके पास हीरे की अंगूठी है, 367 ऐसे हैं जिनके पास गोल्फ क्लब का एक सेट है, और 562 ऐसे हैं जिनके पास बगीचे की कुदाल है। इसके अलावा, 900 निवासियों में से प्रत्येक के पास कैंडी हार्ट्स का एक बैग है। ऐसे 437 निवासी हैं जिनके पास इनमें से ठीक दो चीज़ें हैं, और 234 निवासी ऐसे हैं जिनके पास इनमें से बिल्कुल तीन चीज़ें हैं। ऐमविले के निवासियों की संख्या ज्ञात कीजिए जिनके पास ये चारों चीज़ें हैं।

8. We know that raw wheat has 70% moisture and dry wheat has 10% moisture. One miller bought 3 tons of raw wheat with price of Rs 40 per kilo. At which price miller has to sell dry wheat, so he gets 80% profit? / हम जानते हैं कि कच्चे गेहूं में 70% नमी होती है और सूखे गेहूं में 10% नमी होती है। एक मिल मालिक ने 40 रुपये प्रति किलो की कीमत पर 3 टन कच्चा गेहूं खरीदा। मिल मालिक को किस कीमत पर सूखा गेहूं बेचना है, ताकि उसे 80% लाभ मिले?

9. A book is published in three volumes, the pages being numbered from 1 onwards. The page numbers are continued from the first volume to the second volume to the third. The number of pages in the second volume is 50 more than that in the first volume, and the number pages in the third volume is one and a half times that in the second. The sum of the page numbers on the first pages of the three volumes is 1709. If n is the last page number, what is the largest prime factor of n ? / एक पुस्तक तीन खंडों में प्रकाशित होती है, जिसके पृष्ठों पर 1 से आगे क्रमांक अंकित होता है। पृष्ठ क्रमांक पहले खंड से दूसरे खंड से तीसरे खंड तक जारी रहते हैं। दूसरे खंड में पृष्ठों की संख्या पहले खंड से 50 गुना अधिक है और तीसरे खंड में पृष्ठों की संख्या दूसरे खंड से डेढ़ गुना है। तीन खंडों के पहले पृष्ठों पर पृष्ठ संख्याओं का योग 1709 है। यदि n अंतिम पृष्ठ संख्या है, तो n का सबसे बड़ा अभाज्य गुणनखंड क्या है?

10. In the diagram below, D and E lie on the side AB , and F lies on the side AC such that $DA = DF = DE$, $BE = EF$ and $BF = BC$. It is given that $\angle ABC = 2\angle ACB$. Find x , where $\angle BFD = x^\circ$. / नीचे दिए गए चित्र में, D और E भुजा AB पर स्थित हैं, और F भुजा AC पर इस प्रकार स्थित है कि $DA = DF = DE$, $BE = EF$ और $BF = BC$ है। यह दिया गया है कि $\angle ABC = 2\angle ACB$. x ज्ञात कीजिए, जहाँ $\angle BFD = x^\circ$.



ALL THE BEST

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