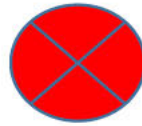# Disha – USS Mathematics

For English medium students

Translation:
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1. Numbers

1. What is the sum of all odd numbers less than 100?
a) 2401 b) 2601 c) 2809 d) 2500

2. If the sum of two prime numbers is 1723 which is the larger number of them?
a) 1722 b) 1721 c) 1718 d) 862

3. 9, 25, 49, 81 ------------------
a) 100 b) 121 c) 144 d) 196

4. In this coding pattern what is 28?

42 ➡ 16204

34 ➡ 92516

72 ➡ 49534

a) 46864 b) 48104 c) 41664 d) 87264

5. In a group of 20 persons each person shakes hands with every other person. What is the total number of handshakes?
a) 200 b) 190 c) 180 d) 230

6. In a queue Priya is 11th from front and 17th from behind. How many are there in the queue?
a) 27 b) 26 c) 29 d) 28

7. If TABLE is written as 54123 and CHAIR is 78469 then TEACHER is
a) 5347389 b) 5347983 c) 5347839 d) 5347938

8. 2, 5, 10, 17 -----------------------
a) 28 b) 25 c) 27 d) 26

9. A cube is made of 64 small cubes. All the six sides of it are painted. What is the number of small cubes which are not painted?
a) 0 b) 16 c) 8 d) 4

10. For 540 how many odd factors are there?
a) 8 b) 12 c) 24 d) 6
11. Which is Ramanujan number?
a) 6173 b) 1729 c) 7361 d) 1721

12. A number written as the product of its prime factors is 2x2x2x3x3x3. Write the number of factors of that number.
a) 6 b) 9 c) 16 d) 10

13. The sum of three consecutive natural numbers is 450. Then what is the sum of the first and last numbers of it?
a) 750 b) 300 c) 149 d) 150

14. How many numbers are there between 100 and 200 for which the sum of the digits is 3?
a) 5 b) 3 c) 10 d) 12
15. If a number is divided by 779 the remainder is 47. If the same number is divided by 19, what is the remainder?
a) 1 b) 10 c) 9 d) 0

16. The Least Common Multiple LCM and the Highest common factor (HCF) of two numbers are 36 and 3 respectively. If one of the numbers is 9 which is the other number?

a) 12 b) 27 c) 16 d) 18

17. On a day three persons took membership in a library. The first person comes to the library to change the books in every 2 days, the second person in 3 days and the third person in 4 days. After how many days they come to the library together?

a) 14 b) 12 c) 13 d) 16

18. The least prime number which is the sum of three prime numbers is:

a) 11 b) 19 c) 23 d) 13

19. 4 times a number is 24 more than the number. Then which is the number?

a) 10 b) 8 c) 9 d) 12

20. 11+72 = 15, 22+66 = 40, 81+81 = 16 Then 35+52 =?

a) 4 b) 22 c) 15 d) 25

21. 6 persons can do a work in 15 days. How long will 18 persons take to finish the same work?

a) 45 b) 27 c) 5 d) 2

22. In a month the dates of 3 Wednesdays are even numbers. Then which day is 20th of that month?

a) Monday b) Wednesday c) Saturday d) Sunday

23. Find the difference of 4 times the largest four digit number and three times the smallest three digit number?

a) 36969 b) 39696 c) 37006 d) 37009

24. To fill a bucket 20 cups of water is needed. To fill a tank 20 buckets of water is needed. To fill a tank how many cups of water is needed?

a) 800 b) 600 c) 400 d) 200

25. By adding a prime number to the product of two consecutive prime numbers the result is 145. Which is the largest of these?

a) 13 b) 11 c) 17 d) 19

26. Of the following numbers which is a multiple of 11?
a) 978626 b) 447355 c) 112144 d) 86756

27. Which is the least number when divided by 12,15 and 20 the remainder is 4 ?

a) 64 b) 44 c) 104 d) 54

28. Three years ago Radha's age was 6 less than that of Lakshmi. What is the difference of their ages now?

a) 6 b) 8 c) 7 d) 9

2.Decimals

1. Half of 0.001 is

a) 0.005 b) 0.0005 c) 0.0002 d) 0.05

2. What is 0.01 × 0.001 / 0.1?

a) 0.0001 b) 0.001 c) 0.01 d) 0.1

3. If a tank is 1.2 m long, 0.8 m wide and 0.2 m high, What is the capacity of the tank?

a) 0.22 litres b) 192 litres c) 192000 litres d) 2200 litres

4. What is the decimal form of 1/16

a) 0.625 b) 62.5 c) 0.0625 d) 625.

5. If the width of the trench is 1.3 m and the area is 3.25 m², What is the length of the trench?

a) 1.2 m b) 1.95 m c) 2.5 m d) 7.6 m.
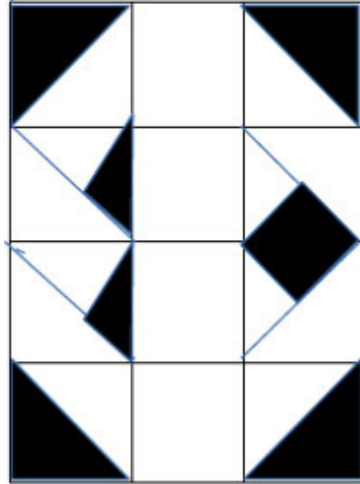
6. Of the following numbers, which is the largest ?

a) 1.36 b) 1.8 c) 1.420 d) 1.72.

7. What do you get by subtracting 0.008 from 0.09?

a) 0.001 b) 0.90 c) 0.0001 d) 0.082

3. Fractional number

1. In the given figure a rectangle is divided in to some squares and some of the parts are shaded. How much of the rectangle is the shaded part?

a) 8/24 b) 5/12 c) 2/6 d) 1/4

2. 1/2 + 1/4 + 1/8 + 1/16 = …………?

a) 1/32 b) 4/30 c) 1/30 d) 15/16

3. Which of the following is correct if 1/3 of 1/2 is multiplied by 1/5?

a) 1/30 b) 3/10 c) 3/30 d) 1/10

4. 4/7 part of a class is girls.2/5 part of girls and 3/5 part of boys are coming to school in vehicles. The number of boys coming in vehicles is what part of the total students?

a) 8/35 b) 14/35 c) 9/35 d) 9/17

5. A man gave 3/8 of his property to the first son, 2/7 to the second son and the other to the third son. What part of the total did the third son get?

a) 19/56 b) 5/15 c) 5/56 d) 1/15

6. 32 litres of water is to be filled in to 4/5 litre bottles. How many such bottles are needed?

a) 32 b) 40 c) 15 d) 6

4.Percentage

50% = 1/2 part	10% = 1/10 part	66 2/3% = 2/3 part
75% = 3/4 part	20% = 1/5 part	12 1/2% = 1/8 part
25% = 1/4 part	331/3% = 1/3 part	6 1/4% = 1/16 part

1. If there are 40 children in a class and 60% of them are girls, how many boys are there?

a) 24 b) 16 c) 20 d) 28

2. A person with a daily income of Rs.750 pays Rs.300 for food.

Calculate the percentage of expenditure for food?

a) 39% b) 40% c) 41% d) 42%

3. If 26 is 12% of a number, what is 30% of that number?

a) 60 b) 52 c) 56 d) 65

4. When a number increased by 20%, it became 720. Which is the original number?

a) 680 b) 700 c) 600 d) 640

5. If the difference between 35% and 45% of a number is 85 then what is the number?

a) 800 b) 850 c) 870 d) 820

6. $33\frac{1}{3}$% of the students in a class got A grade. If that number of students is 15,

Find the total number of students in the class?

a) 42 b) 45 c) 48 d) 397.

b) What is 10% of 10 + 10% of 20 + 10% of 100?

a) 13 b) 10 c) 17 d) 15

8. When 75 is added to 75% of a number, the same number is obtained.

Which is the number?

a) 600 b) 750 c) 300 d) 450

9. 50% of 60 is same as what percentage of 60 × 50?

a) 1% b) 5% c) 2% d) 4%

10. $33\frac{1}{3}$ % of 420 + $66\frac{2}{3}$ % of 42 + 33% of $33\frac{1}{3}$ = --------

a) 187 b) 179 c) 205 d) 203

11. Devu and Lakshmi took 48% and 52% of a sum respectively, Lakshmi got 1200 more than that of Devu.

What was the total amount?

a) 30000 rupees b) 48000 rupees c) 36000 rupees d) 42000 rupees

12. What is the number obtained by subtracting 24% of $8\frac{1}{3}$ from the sum of 40% of $6\frac{1}{4}$ and 50% of $12\frac{1}{2}$?

a) $12\frac{2}{3}$ b) $6\frac{3}{4}$ c) $8\frac{1}{3}$ d) $6\frac{1}{4}$

13. If 52 is obtained by adding $\frac{1}{4}$ of a number and 40% of the same number. Which is the number?

a) 95 b) 50 c) 120 d) 80

14. If $16\frac{1}{4}$ % + $12\frac{1}{2}$ % + 25% + 50% of a number is x, then what fraction of that number is x?
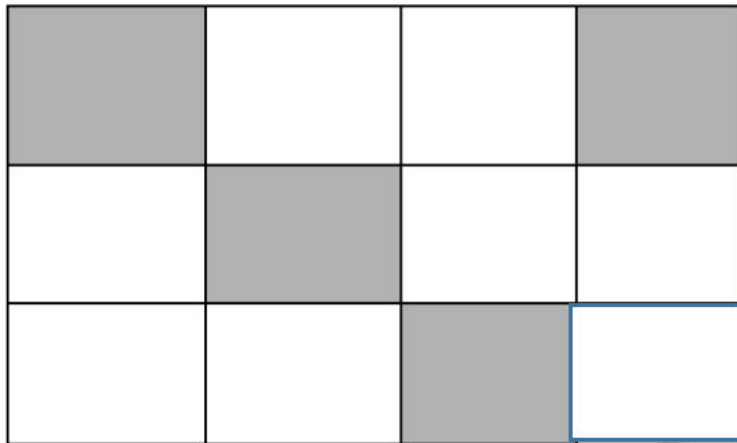
a) 1/16 b) 7/8 c) 15/16 d) 1/8

15. $33\frac{1}{3}$ % of 60 is What percentage of 40?

a) 50% b) 40% c) 60% d) 45%

16.70 What is the sum of 30% of 70 and 70% of 30?

a) 36 b) 42 c) 48 d) 40

17) What percentage of the rectangle is the shaded part?

   a) 35 1/3% b) 27 1/3% c) 33 1/3% d) 38 1/3%

18. The length of a rectangle is increased by 10 % and the breadth is decreased by 10 % what is the difference in the area?
a) Increases 1% b) Decreases 1% c) Equal
d) Increases 10%

19. 10% of x is 20% of y then x/y =.............
a) 1/2 b)1/3 c) 2 d) 3

20. Two tanks have the same capacity. One of them is 20% filled with water. The second one is 40% vacant and it has 80 litre more water than that of the first tank. What is the capacity of the tank?

a) 200 litre b) 400 litre c) 250 litre d) 300 litre

5. Average

Average = Total ÷ Number of items

Number of items = Total ÷ Average

Total = Number of items x Average

1. In a Panchayath, 9000 rupees was collected by 15 schools for chief minister's relief fund. What is the average amount collected by a school?
   a) 400 b) 600 c) 500 d) 550

2. Every day, Raju gives milk to the society. The quantity given from Monday to Friday is as follows.
Monday 12 litre, Tuesday 10 litre, Wednesday 15 litre, Thursday 8 litre, Friday 15 litre.
Find the average milk given per day.
a) 10 litre b)15 litre c) 8 litre d) 12 litre

3. Given below is the number of members of 4 households and the quantity of water they use per month

Name of the house owner	No: of members	Quantity of water used in a month
Ramu	4	16000
Raju	3	13500
Sonu	5	17500
Rahim	6	18000

In which of the houses the average use of water per person is the least?

a) Ramu's b) Raju's c) Sonu's d) Rahim's

4. The sum of five consecutive odd numbers is 125. Which is the first number?

a) 21 b) 22 c) 23 d) 24

5)The average age of a child in a class of 30 is 12. The average age including the teacher is 13. How old is the teacher?

a) 40 b) 51 c) 43 d) 48

6. Of the bundles of school uniform, one contains cloth for giving 6 kids 165 cm each in an average. After giving 170 cm, 165cm, 160 cm, 170 cm and 155 cm to 5 kids, the remaining cloth was exactly of the same length that was needed for the sixth kid. What was that length?

a) 160 cm b) 170 cm c) 150 cm d) 155 cm

7. The number of Covid positive cases of 4 consecutive days is given below. Find the average case of a day.
2500, 3400, 2800, 3200

a) 3000 b) 2975 c) 3045 d) 3100

8. 30 students of class 6 donated 50 rupees on an average to a Mutual aid fund. 20 students of class 5 donated 600 rupees in all. If we consider both classes together, how much did each donate on average?

a) 35 rupees b) 40 rupees c) 42 rupees d) 50 rupees

9. Average of two numbers is 12. If one of them is 9, which is the other number?

a) 14 b) 15 c) 17 d) 19

10. The average age of 10 kids is 12. If 5 more kids are joined with them, the average increases by 1. Then what is the average age of these 5 kids?

a) 12 b) 13 c) 14 d) 15

11. The average of 10 numbers is 13. If one more number is added, the average becomes 15. Which is the new number added?

a) 35 b) 40 c) 32 d) 38

12. In a tug of war team the average weight of 11 members is 80 Kilogram. If a man of 93 kg weight is replaced by another of 82 Kg what is the average weight now?

a) 73 Kg b) 78 Kg c) 79 Kg d) 75 Kg

13. What is the average of 1, 3, 5, 7

a) 4 b) 3 c) 5 d) 7

14. The average of 5 numbers is 27. If a number is excluded, the average becomes 25. Which is the excluded number?

a) 40 b) 35 c) 38 d) 29

15. The average of 5 consecutive numbers is 24. Which is the greatest number?

a) 22 b) 23 c) 24 d) 26

16. The average score a kid got in 7 subjects is 40. His average score excluding Mathematics is 38. What is his score in Mathematics?

a) 45 b) 50 c) 52 d) 49.

17. In a farm of 10 cows a cow giving 8 litres of milk was replaced by another, the average yield was increased by 1 litre. What is the milk yield of the new cow?

a) 10 b) 18 c) 20 d) 22

18. The sum of three consecutive natural numbers is 180. What is the sum of the first and last natural numbers.

a) 100 b) 120 c) 140 d) 160

19. The average of 5 consecutive natural numbers is 20. The average of another 5 consecutive natural numbers is 24. What is the average of these 10 numbers?

a) 44 b) 40 c) 20 d) 22

20. For 7 standard, the total number of online classes obtained for the 7 subjects is 154. What is the average number of classes obtained for one subject?

a) 18 b) 22 c) 25 d) 30

6. Speed Math

Speed = Distance / Time
Average speed = Total distance/Total time taken
Speed in metre/sec = Speed in Km/hr x 5/18

1. What is the average speed of a train which travelled 360 km in 4 hours 30 minutes?
a) 90km/h b) 85km/h c) 80 km/h d) 100 km/h

2. Find the time taken by an aeroplane to travel 5040 km in an average speed of 840 km/hr?
a) 6h b) 8h c) 9h d) 7h

3. A car runs 20 metres in a second. How many kilometres does it run in 2 hours?
a) 72km b) 144km c) 120km d) 200km

4. What is the average speed of a car travelling 270 km in 2 hours 15 minutes?
a) 60km/h b) 72km/h c) 100km/h d) 120km/h

5. 40 km/hr is the average speed of a car. How many kilometres will it cover in 2 hours 30 minutes?
a) 60km b) 72km c) 100km d) 120km

6. A bus travels $4\frac{1}{2}$ Km distance in $7\frac{1}{2}$ minutes. What is the speed of the bus in Km/hr
a) 60km/h b) 72km/h c) 36km/h d) 30km/h

7. A 200 m long train passes a telephone post in 10 seconds. What is the speed of the train?

a) 60km/h b) 72km/h c) 36km/h d) 30km/h)

8. $22\frac{1}{2}$ m/sec is how much km/hr?

a) 81km/hr b) 72km/hr c) 36km/hr d) 60km/hr)

9. The speed of a 120m long train is 90 km/hr. Find the time taken by it to cross a 605m long bridge?

a) 24sec b) 25sec c) 30sec d) 29sec

10. Athira took 8 minutes to cross a bridge of length 800 m. What is the speed of Athira?

a) 6km/h b) 8km/h c) 10km/h d) 12km/h

11. A cycle rider travels 24 Km/hr speed. Find the distance travelled by him in 30 seconds ?

a) 100m b) 150m c) 48m d) 200m

12. What is the average speed of a man travelling from A to B at 60 Km / h and from B to A 90 Km/h ? a) 60km/hr b) 72km/hr c) 36km/hr d) 30km/hr)

13. Raju runs 100 metres in 20 seconds. How far does he run in one minute?

a) 300m b) 150 c) 100m d) 200m

14. A man travels 120 Km from his house at a speed of 30 Km/hr and returns home at a speed of 20 Km/hr. What is his average speed?

a) 24km/h b) 48km/h c) 36km/h d) 30km/h

15. A man starts his journey at 8 a.m and reaches the town 90 Km away at 10 a.m by a car. What is the speed of the car?

a) 24km/h b) 45km/h c) 36km/h d) 30km/h

16. If a train moving at a speed of 90 Km/hr delayed to apply the break by one second how long would have it moved?
a) 20m b) 30m c) 15m d) 25m

7.Algebra

1. Which of the following is exactly an odd number?

a) 2n+1 b) n+1 c) n-1 d) 2n

2. The price of a book and pen is 16 rupees. The price of the book is 10 rupees more than that of the pen. Then what is the price of the pen?

a) 6 rupees b) 10 rupees c) 3 rupees d) 13 rupees

3. A nine number square is to be marked in a calendar. The sum of the first and the last number of this square is

32. Which is the middle number?

a) 16 b) 10 c) 8 d) 7

4. Which of the following is equal to
 a(b-c) + b(c-a) + c(a-b)?

a) a-b-c b) 0 c) a+b+c d) abc

5. Which of the following is equal to (x-y)-z

a) x-(y+z) b) x+(y-z) c) x-(y-z) d) x+y+z

6 Which of the following is equal to (x+y)-z?

a) x-(y+z) b) x+(y-z) c) x-(y-z) d) x+y+z

7 Which of the following is equal to (x-y)+z?

a) x- (y + z) b) x+(y-z) c) x-(y-z) d) x+ y + z

8. $2x \times x^0 =$?

a) 2x b) 3x c) 2x2 d) x^2

9. In a calendar the sum of nine numbers making a square is 90. Which is the first date of this square?

a) 3 b) 1 c) 4 d) 2

10. The price of a bag and umbrella is 500 rupees. The price of the bag is 150 more than that of the umbrella, what is the cost of the umbrella?

a) 150 b) 450 c) 325 d) 175

<mark>8.Geometrical shapes</mark>

1. Which is the third number of the Pythagorean triplet?
14, 50, ...
a) 52, b) 48 c) 46 d) 54

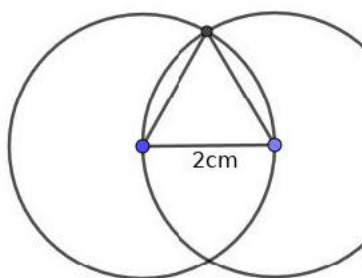2. Which of the following is not the sides of a triangle
a) (3cm, 2cm, 8Cm) b) (4Cm,6Cm,7Cm) c) (8Cm,6Cm,13Cm)

3. The perpendicular sides of a right angled triangle Are 12 and 15 centimetres long. Another right angled triangle of the same area has one of the perpendicular sides 18 centimetres long.
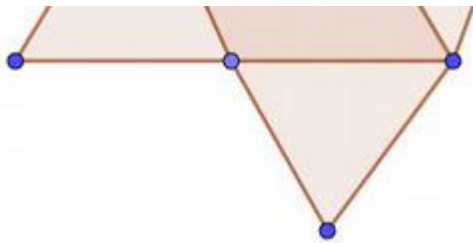What is the length of the other?
a) 10, b) 20 c) 12 d) 22

4.

See the figure. One side of the triangle is given as 2 cm. What is the length of the other sides of the triangle?
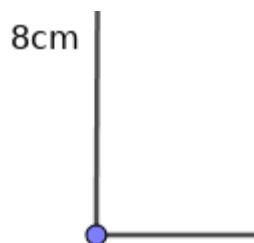
a) 4cm, b) 2cm c) 3 cm d) 1cm

5. The figure given below is drawn using the set-squares. How many angles are there in it?
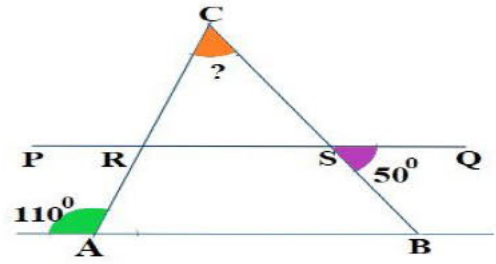

a) 19 b) 20 c) 21 d) 22

6. From a card board of 12cm length 8cm breadth a rectangle of 2cm length and 5 cm breadth is cutting off. The area of this figure is 86 sq.cm. and the length of the cut off piece is 5 cm. What is the perimeter of the shape
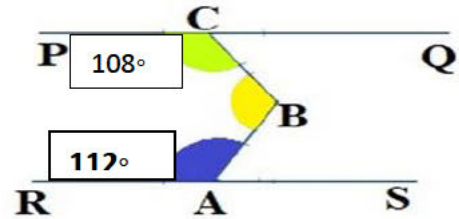

8cm

obtained?

a) 54 b) 44 c) 34 d) 96
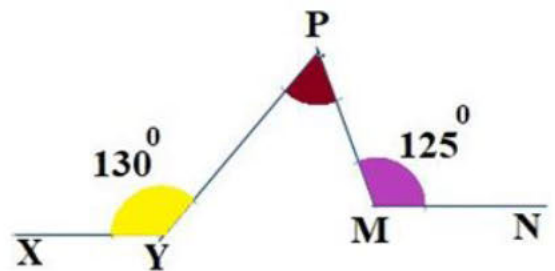
7. In the figure AB // PQ
    Compute the value of <C.

a) 50⁰ b) 60⁰ c) 70⁰ d) 85⁰

8. In the figure PQ || RS,
Compute the value of
<ABC.

a) 220⁰ b) 72⁰ c) 68⁰ d) 140⁰

9. In the figure XY || MN
.Compute
   the value of <YPM.

a) 50⁰ b) 55⁰ c) 125⁰ d) 75⁰
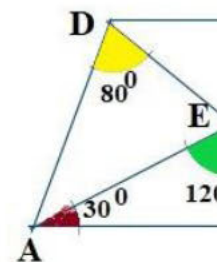
10. In figure AB// CD// EF
    calculate the angle value
    of the shaded region?
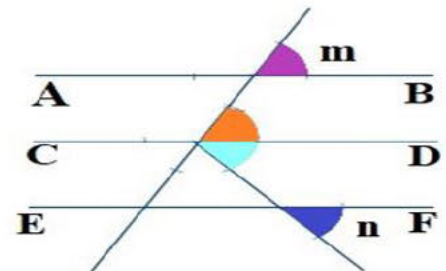
   a) m b) n c) m + n d) m – n

11. സാമാന്തരീകം ABCD യിൽ
    <EBC =?

    a)   30⁰ b) 60⁰ c) 80⁰ d) 90⁰

12. In the figure AC // BD, compute < DBE.

a)   50º b) 60º c) 70º d) 120º
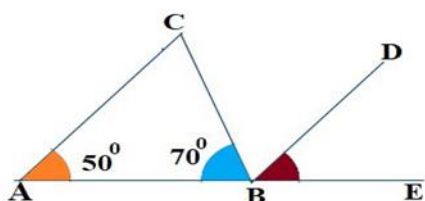
13. In a linear pair, one angle is double the other. Write the measurement of the larger angle.

a) 30º b) 60º c) 90º d) 120º

14. The sides of a triangle are 8 cm, 10cm and x cm Which is the largest possible value of x?

a) 18 cm b) 19 cm c) 17 cm d) 16 cm

15. The sides of a triangle are 12 cm, 10cm, x cm Which is the least possible value of x?

a) 5 cm b) 3 cm c) 1 cm d) 22 cm

16. In a pair of complementary angles one of them is twice that of the other, write the measurement of the smaller angle?

a) 30º b) 60º c) 90º d) 45º

17. The midpoints of a square of sides 10 cm is joined and the triangles so formed at the four corners is cut off. What is the area of the remaining figure?

a) 100cm² b) 50 cm² c) 25 cm² d) 12 cm²

18. In a strong wind, an areca nut tree was cut at a height of 5m from the ground and the top of it touches the ground at a distance of 12m away from the bottom. What is the length of the slanted part?

a) 17 m b) 7 m c) 13 m d) 25 m

19. 35 minutes after seeing a clock face showing 2.25 in a mirror, Sonu went to bed. Write the angle measurement between the hands of the clock at that time?

a) 118 ° b) 131° c) 1250 d) 115°

20. What is the angle measurement between the hands of the clock at that 3.42?

a) 153° b) 141° c) 132° d) 148°

21. A swimming pool of 12 m length, 10m breadth and 1.5 m depth is to be built. The soil dug out is removed in a truck which can carry a load of length 2.5 m breadth 1.2 m and height 1.2 m. How many truckloads of soil have to be moved?

a) 50 b) 60 c) 40 d) 45

9. Repeated multiplication

Laws of exponents

1. $X^m \times X^n = X^{m+n}$

2. $X^m / X^n = X^{m-n}$, $m>n$

3. $X^m / X^n = 1/X^{n-m}$, $m<n$

4. $X^{-n} = 1/X^n$, $X \neq 0$

5. $X^m / X^n = 1$ $m=n$

6. $X^\circ = 1$, $X \neq 0$

7. $(X^m)^n = X^{m \times n} = X^{mn}$

8. $(X^a Y^b Z^c)^m = X^{am} Y^{bm} Z^{cm}$

1. $(2x^2)^3$ ന് സമാനമായത് ഏത്?

a) $4x^6$ b) $8x^5$ c) $6x^5$ d) $8x^6$

2. $n^3 \times (n^3)^{-4}$

a) n^{15} b) $1/n^9$ c) n^{-10} d) $1/n^{10}$

3. $3^3 \times 2^{-4} \times 4^{10}$

a) $1\frac{11}{16}$ b) $\frac{9}{4}$ c) $-\frac{9}{4}$ d) $-1\frac{11}{16}$

4. What is $2^\circ \times 3^\circ \times 4^\circ$?

a) 24 b) 0 c) 1 d) 9

5. If $10^{10} - 1$ is written as a natural number what is the sum of its digits?

a) 90 b) 99 c) 81 d) 101

Number of factors

Perfect numbers

Perfect Number	Positive Factors	Sum of all factors excluding itself
6	1, 2, 3, 6	6
28	1, 2, 4, 7, 14, 28	28
496	1, 2, 4, 8, 16, 31, 62, 124, 248, 496	496
8,128	1, 2, 4, 8, 16, 32, 64, 127, 254, 508, 1016, 2032, 4064, 8128	8,128

A perfect number is a positive integer, which is equal to the sum of its factors excluding itself.

6. Which of the following numbers is having the number of factors an odd number?

a) 8025 b) 2025 c) 4025 d) 6025

7. The number of factors of $6^4 \times 5$ is :

a) 16 b) 10 c) 25 d) 50

8. Write the number of factors of $6^2 \times 2^4 \times 3$?

a) 30 b) 15 c) 8 d) 28

9. The largest exponent of the factors of $6^5 \times 10^4 \times 14^3$ is:

a) 28 b) 210 c) 212 d) 214

10. Which of the following numbers is not written as the product of prime factors?

a) $2^2 \times 3^3 \times 5^2$ b) $2^8 \times 5 \times 3$ c) $9^2 \times 5^5 \times 7^2$ d) 7^{35}

11. Which is the smallest perfect number?

a) 2 b) 4 c) 6 d) 28

12 Which of the following is a perfect number?

a) 9 b) 16 c) 24 d) 28

The last digit of powers of numbers

X =	X^1	X^2	X^3	X^4	X^5	X^6	X^7	X^8	X^9
	1	1	1	1	1	1	1	1	1
	2	4	8	6	2	4	8	6	2
	3	9	7	1	3	9	7	1	3
	4	6	4	6	4	6	4	6	4
	5	5	5	5	5	5	5	5	5
	6	6	6	6	6	6	6	6	6
	7	9	3	1	7	9	3	1	7
	8	4	2	6	8	4	2	6	8
	9	1	9	1	9	1	9	1	9

1, 5, 6 are the numbers having the same last digit in any power of it.

The last digit of powers of

2 - 2, 4, 8, 6

3 - 3, 9, 7, 1

7 - 7, 9, 3, 1

8 - 8, 4, 2, 6

The last digit of powers of 4,

If the exponent is odd, 4; if the exponent is even, 6

The last digit of powers of 9,

If the exponent is odd, 9; if the exponent is even, 1

13. Which of the following is not an odd number?

a) 3^3 b) $3^3 + 3$ c) 3^{3+3} d) 3^{3-3}

14. If n= 53, The last digit of $3^n + 2^n$ is:

a) 0 b) 2 c) 3 d) 5

15. The digit in the ones place of the expanded form of 2^{17} ?

a) 2 b) 4 c) 6 d) 8

16. The digit in the ones place of $2+ 2^2+ 2^3+ 2^4+$ ....$+ 2^{32}$ is

a) 6 b) 4 c) 2 d) 0

17. The ones place digit of $9+ 9^2+ 9^3+ 9^4$............ $+ 99^9$?

a) 0 b) 7 c) 1 d) 9

18. The ones place digit of 6^{128}

a) 8 b) 4 c) 6 d) 3

19. The digit in the ones place of $5^{75} + 6^{75}$?

a) 9 b) 1 c) 6 d) 8

20. The digit in the ones place of $(173)^{18} \times (176)^{18}$

a) 2 b) 3 c) 4 d) 6

21. The digit in the ones place of 128^5

a) 6 b) 8 c) 4 d)

10. Squares and square roots

$$\sqrt{XY} = \sqrt{X} \times \sqrt{Y}$$
$$\sqrt{X^n} = x^{n/2}$$

1. If the digit in the ones place of a number is 2, 3, 7 or 8, then, that number is not a perfect square.

2. The sum of the digits of a perfect square is always 1, 4, 7 or 9.

3. The square of an odd number is always odd.

4. The square of an even number is always even.

5. The prime factors of a perfect square can be grouped into pairs.

6. If in the prime factorisation of a number any of the factors are not in pairs, by multiplying or dividing that number by the prime number/s, the resulting number is a perfect square.

7. In a perfect square, the number of zeroes as the last digits, is always even. To find out the square root of such numbers, find the square root of the number excluding the zeroes, then add half the number of zeroes as the last digits.

22. The square of 1/4 is

a) Less than zero
b) Less than 1/4
c) Greater than 1/4
d) Greater than 1

23. The difference of two alternate perfect squares is 132. Which is the perfect square in between these perfect squares.

a) 1089 b) 1156 c) 1225 d) 1681

24. $10^2 - 9^2 + 8^2 - 7^2 + 6^2 - 5^2 + 4^2 - 3^2 + 2^2 - 1^1$

   a) 0 b) 55 c) 100 d) 225

25. Which of the following is not a perfect square?

a) 3354176 b) 18117716 c) 2178576 d) 1577536

26. The sum of digits in the product
11111111 × 1111111 ?

a) 49 b) 56 c) 64 d) 81

27. Which of the following is a perfect square?

a) 95 x 59 x 43 b) 35 x 53 x 64 x 46 c) 74 x 53 x 87 x 35
d) 26 x 54 x 36 x 43

28. 15876, 16129 are the squares of two consecutive natural numbers. Which number is to be added to 16129 to get the next perfect square?

a) 256 b) 251 c) 255 d) 253

29. $\sqrt{3^n}$ = 729, Find the value of n

a) 12 b) 9 c) 36 d) 7

30. If $\sqrt{x}/169$ = 36/26 , x= ?

a) 169 b) 1269 c) 324 d) 676

31. The square of 6 1/4 ?

a) $3\frac{1}{2}$ b) $2\frac{1}{2}$ c) $3\frac{1}{4}$ d) $2\frac{1}{4}$

32. In between which numbers is the value of $\sqrt{300}$?

a) 20, 21 b) 19, 20 c) 17, 18 d) 18,19