



# MATHS

BOOKS - UNITED BOOK HOUSE

JHOWDANGA SAMMILANI HIGH  
SCHOOL

## Exercise

1. Total interest of Rs 400 for  $2\frac{1}{2}$  years at the rate of 6% simple interest per annum is

A. Rs 60

B. Rs 40

C. Rs 50

D. Rs 30

**Answer:**



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2. If  $a \propto \frac{1}{b^2}$  then

A.  $b \propto \frac{1}{a^2}$

B.  $b\alpha \frac{1}{\sqrt{a}}$

C.  $b\alpha \frac{1}{-\sqrt{a}}$

D.  $b\alpha \frac{1}{\pm\sqrt{a}}$

**Answer:**



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3.  $O$  is the circumcenter of  $\triangle ABC$ . If  $\angle BAC = 50^\circ$  then  $\angle OBC =$

A.  $100^\circ$

B.  $40^\circ$

C.  $50^\circ$

D.  $30^\circ$

**Answer:**



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**4.** Total surface area of a solid hemisphere of radius 7 cm is

A.  $588\pi \text{ sq. cm}$

B.  $392\pi \text{ sq. cm}$

C.  $147\pi \text{ sq. cm}$

D.  $98\pi \text{ sq. cm}$

**Answer:**



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5. ABCD is a cyclic quadrilateral. If  $\angle A = 120^\circ$ ,

then the circular value of  $\angle C$  is

A.  $\frac{\pi^c}{3}$

B.  $\frac{2\pi^c}{3}$

C.  $\frac{\pi^c}{6}$

D.  $\pi^c$

**Answer:**



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**6.** If the mode of the data 16,15,17,16,15,x,19,17,14

is 15 then  $x=$

A. 19

B. 17

C. 15

D. 16

**Answer:**



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**7. Fill in the blanks :**

In a business Bimal invests Rs 1800 and Biplab invests Rs 1000 for 9 months. If the profit

share of them are equal then Bimal's money invests for \_\_\_\_\_ months.



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**8.** Fill in the blanks:

Roots of the equation  $x^2 - x + c = 0$  are always imaginary if the value of C is \_\_\_\_\_



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**9.** Fill in the blanks:

Cycline parallelogram is always.\_\_\_\_\_



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**10.** Fill in the blanks:

Ratio of volume of the right circular cone, hemisphere and a right circular cylinder of equal base and equal height is\_\_\_.



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**11.** Fill in the blanks:

If the angle of elevation of the Sun is\_\_\_\_,then  
the length of shadow of tower and the length  
of tower are equal.



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**12.** Fill in the blanks

Mean, median, mode are the measure of\_\_\_\_\_.



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### 13. Write True or False

Compound interest of Rs  $2p$  for  $\frac{n}{2}$  years at the rate of interest  $2r\%$  per annum is Rs  $2p\left(1 - \frac{r}{50}\right) - 2p$ .



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### 14. Write True or False

Compound ratio of any ratio and its inverse ratio is 1:1.



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### 15. Write True or False

P is any point inside the circle. The tangent to the circle always passes through the point P.



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### 16. Write True or False

A sphere is made by melting a right circular cylinder of radius 3 cm in length. If the radius of them is equal then the volume of them are equal.



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**17. Write True or False**

Value of  $\cos 54^\circ$  and  $\sin 36^\circ$  are same.



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**18. Write True or False**

From o give, we get mode of the data.



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**19.** If the rate of increase in population is  $r\%$  per year, the population after  $n$  years is  $p$ , find the population that was  $n$  years before.



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**20.** In a business, the ratio of the capital of A, B and C is  $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$ . At the end of the year . If the profit is Rs 1690 then calculate the profit share of B.



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21. If  $2x + 1/x = 2$ , then find the value of

$$\frac{x}{2x^2 + x + 1}.$$



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22. If  $(a + b) : \sqrt{ab} = 4 : 1$  then find a:b.



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23.  $AB$  is the diameter of a hemisphere with radius 4 cm in length and  $\angle ACB$  is a semicircular angle. If  $BC = 2\sqrt{7}cm$ , then find the length of  $AC$ .



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24.  $ABCD$  is a cyclic quadrilateral.  $AB$  extended upto  $X$ . If  $\angle XBC = 89^\circ$  and  $\angle ADB = 47^\circ$  then find  $\angle BAC$ .



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**25.** O is the centre of a circle. An external point P is 26 cm away from the centre of the circle and the length of the tangent (PT) drawn from the point P to the circle at T is 10 cm. Calculate the length of the diameter of the circle.



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**26.** In a circle, if an arc of 220 cm length subtends an angle of measure  $63^\circ$  at the centre, then determine the radius of the circle.



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**27.** If the ratio of length of shadow of a tower and height of the tower is  $\sqrt{3}:1$ , find the angle of elevation of the Sun.



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**28.** The lower and upper part of a solid object are hemispherical and conical respectively. If the area of total surface of 2 parts are equal,

then find the ratio of the height of two parts of this object.



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**29.** The length of diagonal of each surface of a cube is  $4\sqrt{2}$ cm. Calculate that total surface area of the cube.



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30. If  $u_i = \frac{x_i - 25}{10}$   $\sum f_i u_i = 20$  and  $\sum f_i = 100$ , find  $\bar{x}$ .



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31. The amount (Principal along with interest) of some money becomes Rs 496 in 3 years and Rs 560 in 5 yrs. At the same rate of simple interest in percent per annum. Find the principal and the rate of simple interest in percent per annum.



**32.** A and B have started a business together with capitals of Rs 6,200 and Rs 10,000 respectively. They have to decide that for observation the business A will get 20% of the profit and 10% of rest of the profit will deposite the ratio of the remaining part of the profit divided among them according the ratio of their investment. IF the total profit at the end of the year is Rs 45,000 then finbd the profit share of A.



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**33.** If one root of the equation  $ax^2 + bx + c = 0$  ( $a \neq 0$ ) is twice the other, than show that  $2b^2 = 9ac$ .



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**34.** Solve:  $\frac{a}{x-b} + \frac{b}{x-a} = 2$  ( $x \neq b, a$ )



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35. If  $x = \frac{\sqrt{3} + 1}{\sqrt{3} - 1}$  and  $xy=1$  then find the value of  $\frac{3x^2 + 5xy + 3y^2}{3x^2 - 5xy + 3y^2}$



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36. If 15 farmers can cultivate 18 bighas of land in 5 days, then calculate by using theory of variation the number of days required by 10 farmers to cultivate 12 bigas of land.



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37. If  $\frac{a^2}{b+c} = \frac{b^2}{c+a} = \frac{c^2}{a+b} = 1$ , show that  $\frac{1}{1+a} + \frac{1}{1+b} + \frac{1}{1+c} = 1$



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38. If the 1st and 2nd of the five numbers in continued proportion are 2 and 6 respectively, the find the fifth number.



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**39.** Prove that opposite angles of a cyclic quadrilateral are supplementary



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**40.** State and prove Pythagoras theorem.



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**41.**  $N$  is the foot of the perpendicular from  $P$  to the diameter  $AB$  of the circle  $APB$ .  $P$  lies on the

circle APB. Prove that  $PB^2 = AB \cdot NB$ ,



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**42.** Two chords AB and CD of a circle with centre O intersect at P. Prove that  $\angle AOD + \angle BOC = 2\angle BPC$ .



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**43.** Draw a right angled triangle whose adjacent sides of the right angle are 7 cm and

9 cm. Now draw the incircle of this triangle.



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**44.** Geometrically find the value of  $2\sqrt{7}$ . (Only traces of construction are required).



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**45.** If the sum of two angles is  $135^\circ$  and their difference is  $\frac{\pi}{2}$ , then determine the sexagesimal and circular value of two angles.



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46. If  $\cos \theta = \frac{x}{\sqrt{x^2 + y^2}}$  show that  
 $x \sin \theta = y \cos \theta$ .



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47. Find the value of  
 $\cos^2 30^\circ - 2 \cos^2 60^\circ - 4 \sin^2 45^\circ + \tan 45^\circ$ .



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**48.** Two towers are situated at a distance of 150 metre and the height of one is 3 time the height of the other. From the mid point of the line joining the bottom of them the angles of elevation of the top of two towers are complementary,. Find the heights of two towers



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**49.** From a point on the horizontal line through the foot of a chimney the angle of

elevation of the top of the chimney is  $30^\circ$  . and the angle of elevation is  $60^\circ$  at a point on the same straight line 50 metres nearer to the chimney. What is the height of the chimney?



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**50.** There were 800 lit . 735 lit. and 575 lit. Kerosine oil in three Kerosine oil drums of the house. The oil of these three drums is poured into a cuboidal pot and for this, the dept of oil in drums becomes 7 dcm. If the ratio of the

length and breadth of the cuboidal pot is 4:3

then find the length and breadth of the pot.



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**51.** There is some water in a cylindrical pot whose base diameter is 12 cm in length. A solid spherical ball is immersed in this cylindrical pot and water level raised in 1 cm. Find the length of diameter of spherical ball.



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**52.** A right circular cylindrical tank of 9 metre height is filled with water. Water comes out from there through a pipe having length of 6 cm diameter with a speed of 225 metre per minute and the tank becomes empty after 2 hrs. 24 minutes. Calculate the length of diameter.



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53. Find the mean of the following data .

Class limit	0-14	15-28	28-42	42-56	56-70
frequency	7	21	35	15	16



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54. Find the median of given data :

Class interval	1-5	6-10	11-15	16-20	21-25	26-30	31-35
Frequency	2	3	6	7	5	4	3



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55. Make a cumulative frequency (less than type) table and draw a o give from the give data.

Marks	5-10	10-15	15-20	20-25	25-30
No. of students	7	9	12	8	6



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