

MATHS

BOOKS - UNITED BOOK HOUSE

JODHPUR PARK BOYS'S SCHOOL

EXERCISE

1. If
$$A=ig\{x\in C\!:\!x^2=1ig\}$$
and $B=ig\{x\in C\!:\!x^4=1ig\}$,then $A\cup B$ is :

A. a){-1,i}

B. b){-1,1}

 $\mathsf{C.c})\{\,\pm\,1,\,\,\pm\,1i\}$

D. d) ϕ



2. Prove that
$$\frac{1}{2\sin 10^{\circ}} - 2\sin 70^{\circ} = 1.$$

A. a)0
B. b)1
C. c)2
D. d)4

3. IF cosA+cosB=m and sinA+sinB=n,where m, $n \neq 0$ then sin(A+B)is equal to ___

A. a)
$$\displaystyle \frac{mn}{m^2+n^2}$$

B. b) $\displaystyle \frac{2mn}{m^2+n^2}$
C. c) $\displaystyle \frac{m^2+n^2}{2mn}$
D. d) $\displaystyle \frac{mn}{m+n}$

4. If 1,log $_9ig(3^{1-x}+2ig)$ and $\log_3(4.3^x-1)$ are in A.P.,then x is equal to

A. a) $\log_4 3$

 $\mathsf{B}.\,\mathsf{b}){\log_34}$

C. c) $1 - \log_3 4$

D. d) $\log_3 0.25$

5. $(666...n imes)^2$ +(888..n times) is equal to ___

A. a)
$$rac{4}{9}(10^n-1)$$

B. b) $rac{4}{9}(10^{2n}-1)$
C. c) $rac{4}{9}(10^n-1)^2$

D. d)none of these



6. If ω is an imaginary cube root of unit, then the value of the

expression

$$\begin{pmatrix} 1+\frac{1}{\omega} \end{pmatrix} \left(1+\frac{1}{\omega^2}\right) + \left(2+\frac{1}{\omega} \right) \left(2+\frac{1}{\omega^2}\right) + \left(3+\frac{1}{\omega} \right) \left(3+\frac{1}{\omega^2}\right) \\ + \dots + \left(n+\frac{1}{\omega} \right) \left(n+\frac{1}{\omega^2} \right)$$

A. a)
$$rac{n(n^2+2)}{3}$$

B. b) $rac{n(n^2-2)}{3}$
C. c) $rac{n(n^2+1)}{3}$

D. d)none of these



A. a)
$$\left(-\infty, rac{1}{3}
ight)$$

B. b)(1/3,5)

C. c)
$$(5,\infty)$$

D. d) $\left(-\infty,rac{1}{3}
ight)\cup(5,\infty)$



8. If the foot of perpendicular from the origin to a straight line is at

the point (3,-4),then the equation of the line is ____

A. a)3x-4y=25

B. b)3x-4y+25=0

C. c)4x+3y=25

D. d)4x-3y=24

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9. The area boundede by the curves y=|x|-1and y=-|x|+1 is__



B. b)2 sqs.units

C. c)
$$2\sqrt{2}squares$$

D. d)4 sq.units

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10. A ray of light along $x + \sqrt{3}y = \sqrt{3}$ gets reflected when reaching x-axis,the equation of refelcted ray is

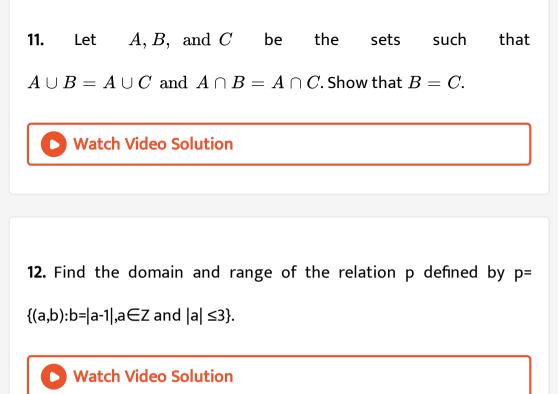
A. a)y=x+1

B. b)
$$\sqrt{3}y = x - \sqrt{3}$$

C. c) $y=\sqrt{3}x-3$

D. d)none of these





13. If x be real show that $\cos \theta$ cannot be equal to x+1/x.



14. If
$$\cos heta = an^2 igg(rac{ heta}{2} igg)$$
 show that $\cos heta = \sqrt{2} - 1$

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15. If $an 15^\circ = x$ then show that $x^2 + 2\sqrt{3}x - 1 = 0$

16. If
$$\omega$$
be an imaginaryb cube root of unity, then prove that,
$$\frac{1}{1+2\omega} + \frac{1}{2+\omega} - \frac{1}{1+\omega} = 0$$

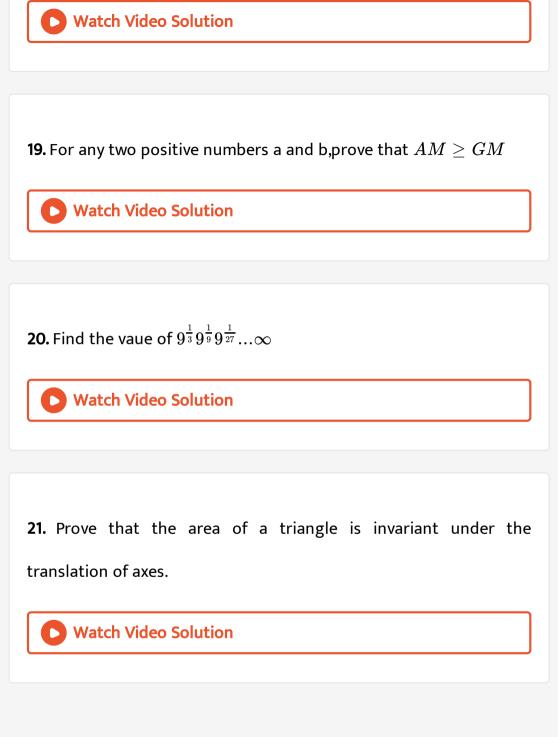
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17. Show that the middle term in the expansion of $\left(x - \frac{1}{x}\right)^{2n}$ is

$$rac{1.3.5.7....\left(2n-1
ight)}{n!}ig(-2ig)^n$$

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18. Find the sum of all factors of the number 3645.



22. If t_1 and t_2 are the roots of the equation $t^2 + \lambda t + 1 = 0$, where λ is an orbitary constant, then prove that the line joining the point $(at_1^2, 2at_1)$ and $(at_2^2, 2at_2)$ always passes through a fixed point. Also find that point.

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23. Prove that $A imes (B \cup C) = (A imes B) \cup (A imes C)$

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24. Find the distance from the eye at which a coin must be placed so as just to hide the full moon. The diameter of coin being 2 cm and the diamter of the moon makes an angle 31'at the eye of the observer.

25. If
$$\cos(\alpha + \beta) = \frac{4}{5}$$
. $\sin(\alpha - \beta) = \frac{5}{13}$ and α , β lie between 0 and $\frac{\pi}{4}$ then find the value of $\tan 2\alpha$

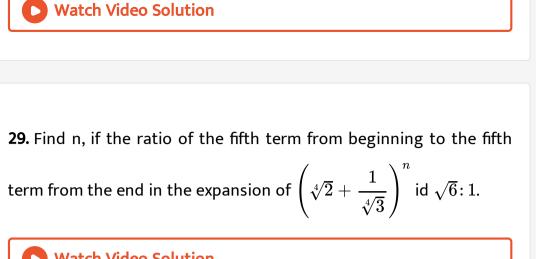
26. Prove that
$$\cos\left(\frac{2\pi}{7}\right) + \cos\left(\frac{4\pi}{7}\right) + \cos\left(\frac{6\pi}{7}\right) = -\frac{1}{2}$$

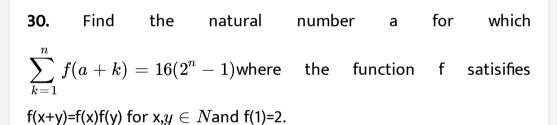
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27. Solve $:6x^2 - (5+3i)x + 11i - 3 = 0$ in the complex plane C.

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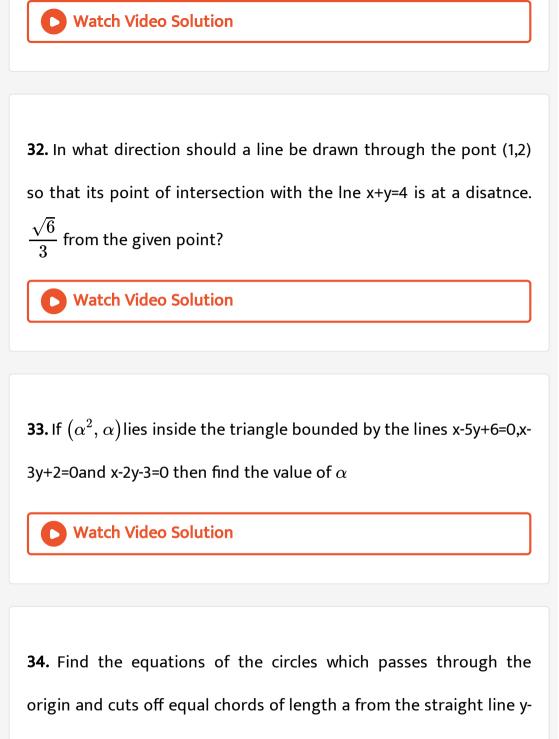
28. Find the sum of first n terms of the series: $\frac{1}{1+1^2+1^4} + \frac{2}{1+2^2+2^4} + \frac{3}{1+3^2+3^4} \dots$





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31. The line joing two points A(2,0)and B(3,1)I rotated about A in anti clockwise direction through an angle of 15° . If B goes to C in the new position, what will be the co-ordinates of C?



x=0 and y+x=0

35. Show that
$$\operatorname{tan}\left(142\left(rac{1^\circ}{2}
ight)
ight)=2+\sqrt{2}-\sqrt{3}-\sqrt{6}$$

36. If A+B+C= π ,prove that :cosA+cosB-cosC=-1+4cosA/2cosB/2sinC/2.

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37. Solve :
$$rac{|x+3|+x}{x+2} > 1, x \in R$$
,

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38. Find principal amplitude of
$$\left(1+i an{\left(rac{3\pi}{5}
ight)}
ight)$$



39. A square is draw by joing the mid points of the sides of a given square. A third square is draw inside the second square in the same way and this process continues indefinitely. If the side if the first square is 16 cm. determine the sum of the areas of all the squares.



40. On the portion of the line x+3y-3=0 which is intercepted between the coordinate axes, a square is constructed on the side of line away from the origin .Find co-ordinates of the intersection of its diagonals.Also find the equation of the opposite side of the given side.



41. Find the locus of the midpoint of the chords of the parabola

 $y^2 = 4ax.$ which subtend a right angle at the vertex.

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