



MATHS

BOOKS - JBD PUBLICATION

MODEL PAPER (15)



1. What is the set builder form of the set {1,2,3}.

2. The range of the function $f(x)=rac{x+2}{|x+2|}$, x
eq-2

is:

A. {-1,1}

B. {-1,-,1}

C. {1}

 $\mathsf{D}.\left(0,\infty
ight)$

Answer:



3. The solutions of the equation $\sin^2 x + 3\sin x = 0$ is:

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

B. $\frac{3\pi}{3}$

 $\mathsf{C.}\,\pi$

D. none of these

Answer:

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4. The value of
$$\left(2+\sqrt{3}
ight)\left(2-\sqrt{3}
ight)$$
 is:

A. 7

B. 3

C. -7

D. none of these

Answer:

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5.
$$nC_r + C_{r+1} = C_r C_r$$
, then x is equal to:

A. 2r

$$\mathsf{B.}\,\frac{r-1}{2}$$

C. r+1

D. none of these

Answer:





6. The nth term of a G.P. is 128 and the sum of its n terms is 225. If its common ratio is 2, then its first term is:

A. 1

B. 2

C. 3

D. none of these

Answer:

7. The three striaght lines ax+by=c, bx+cy=a and cx+ay=b

are collinear if:

A. a+b-c=0

B. a-b+c=0

C. a+b+c=0

D. none of these

Answer:



8. If the circle $x^2 + y^2 + 2ax + 8y + 16 = 0$ touches x

axis, then the vlaue of a is:

A. ± 1

 ${\rm B.}\pm4$

 $C.\pm 8$

D. none of these

Answer:



9. In a single toss of three coins, the probability of getting head and tail alternatively is:

A.
$$\frac{1}{4}$$

B. $\frac{1}{2}$

C. $\frac{1}{8}$

D. none of these

Answer:

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10. Prove that:
$$rac{\sin x + \sin 3x}{\cos x + \cos 3x} = an 2x$$

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11. Prove that
$$rac{\sin(x+y)}{\sin(x-y)} = rac{ an x + an y}{ an x - an y}$$

12. If
$$z_1 = 2 - i$$
, $z_2 = 1 + i$, find $\left| \frac{z_1 + z_2 + 1}{z_1 - z_2 + 1} \right|$.
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13. Show that $9^{n+1} - 8n - 9$ is divisible by 64, whenever n is a positive integer.
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14. Compute $(98)^5$

15. Using distance formula, show that the points A(6,-7,1), B(2,-3,1) and C(4,-5,0) are collinear.

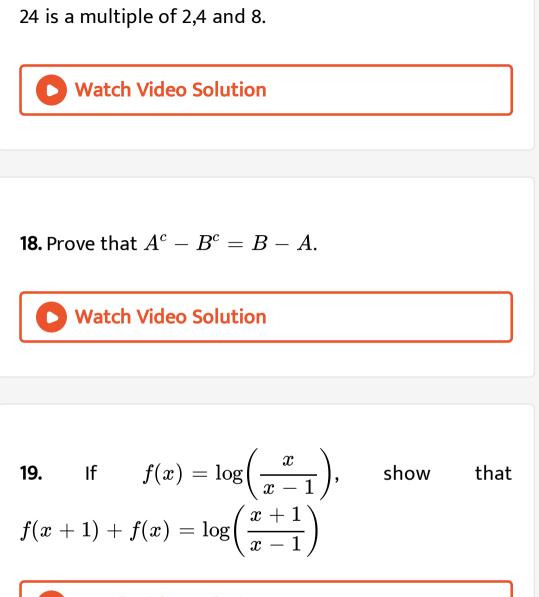


16. Show that the statement is true by the method of contradiction. If x is an integer and x^2 is even, then x is also even.

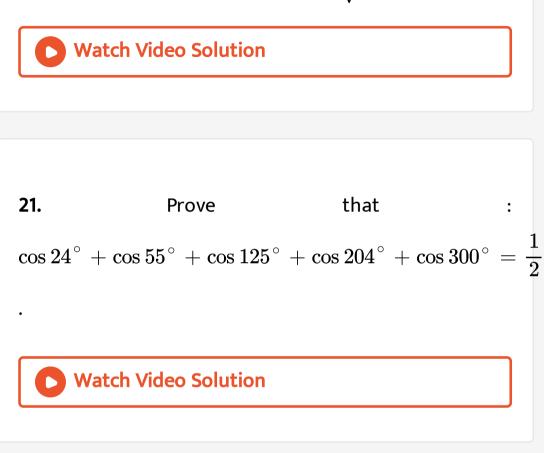
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17. Find the component statement of the following and

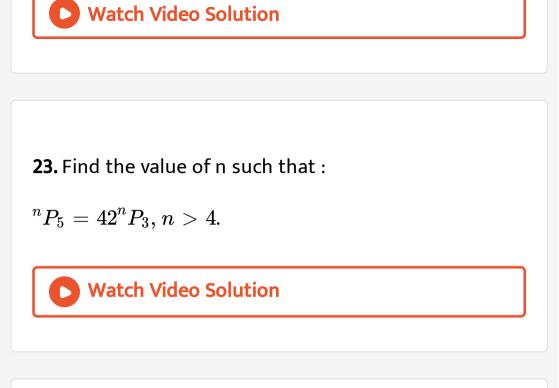
check whether they are true or not.



20. Prove that: $\cos 15^\circ\, - \sin 15^\circ\, = rac{1}{\sqrt{2}}$



22. How many words, with or without meaning, each of 2 vowels and 3 consonants can be formed from the letters of the word DAUGHTER ?



24. Sum of first p,q and r terms of an A.P. are a,b,c

respectively. Prove that

$$rac{a}{p}(q-r)+rac{b}{q}(r-p)+rac{c}{r}(p-q)=0.$$

25. If the angle between two lines is $\frac{\pi}{3}$ and slope of one of the line is $\frac{1}{4}$. Find the slope of other line.



26. If a parabolic reflector is 20 cm in diameter and 50

cm deep. Find the focus.

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 27. Evaluate:
$$\lim_{x \to 1} \frac{(x + x^2 + x^3 + \dots x^n) - n}{x - 1}$$

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28. If y=asinx+bcosx, prove that
$$y^2 + \left(rac{dy}{dx}
ight)^2 = a^2 + b^2$$



29. A,B and C are three mutually exclusive and exhaustive events associated with a random experiment . Find P(A) given that $P(B) = \frac{3}{2}P(A)$ and $P(C) = \frac{1}{2}P(B)$.

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30. Find heta such that $rac{3+2i\sin heta}{1-2i\sin heta}$ is purely real.

31. If
$$a+ib=rac{{{\left({x+i}
ight)}^2 }}{{{2x^2 + 1}}},$$
 prove that $a^2+b^2=rac{{{\left({x^2 + 1}
ight)}^2 }}{{{\left({2x^2 + 1}
ight)}^2 }}.$

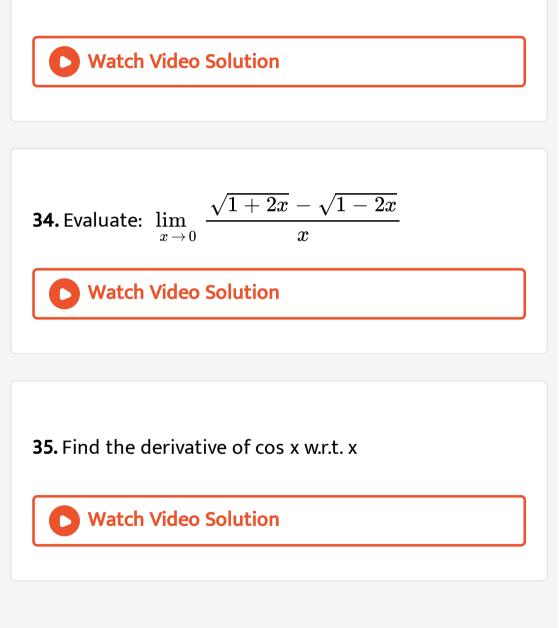


32. Solve the following system of inequalities graphically: $4x + 3y \le 60, y \ge 2x, x \ge 3, x, y \ge 0$

33. IQ of a person is given by the formula
$$IQ = rac{MA}{CA} imes 100$$
 , where MA is mental age and CA is

chronological age. If $80 \leq IQ \leq 140$ for a group of 12

years old children, find the range of their mental age.



36. Find the mean marks from the following data :

Marks	No. of students
Below 10	3
Below 20	5
Below 30	9
Below 40	15
Below 50	20
Below 60	26
Below 70	34
Below 80	41
Below 90	45
Below 100	47



37. Find the mean deviation from the mean for the

following data. 38, 70, 48, 40, 42, 55, 63, 46, 54, 44.