MATHS

BOOKS - UNITED BOOK HOUSE

BETHUNE COLLEGIATE SCHOOL.

Exercise

1. If A={2,4,6,8}then

    A. $\{2, 4\} \in A$

    B. b)$\{2, 4\} \subseteq A$

    C. c)$\{2, 4\} \in A$

    D. d)$\{2, 4\} \in A^c$

Answer:

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2. $\tan\alpha = \dfrac{3}{4}$ and $\alpha + \beta = 45°$ then $\tan\beta =$

A. a)7

B. b)1/7

C. c)7/4

D. d)4/7

Answer:

3. If $Z = \dfrac{\sqrt{3} + i}{2}$,then the value of z^{69} is

A. a)1

B. b)-1

C. c)i

D. d)-i

Answer:

4. if^nC_r+ $\hat{}$ nC_{r+1} = ^(n+1)c_x`then the value of x is

A. a)r

B. b)r+1

C. c)r-1

D. d)n

Answer:

5. If a,b,c are in A.P .then $3^a, 3^b$ and 3^c are in

A. a)A.P

B. b)G.P

C. c)both A.P and G.P

D. d)none of these.

Answer:

6. If the slope of the line joining the points $(3\lambda, 4)$ and $(4, -3\lambda)$ be -3 then the value of λ is

A. a)1/3

B. b)2/3

C. c)3/2

D. d)4/3

Answer:

7. If $\displaystyle\lim_{x \to 3} \dfrac{\alpha x^2 - \beta}{x - 3} = 12$, then find the value of α and β

A. a)$\alpha = 1, \beta = 2$

B. b)$\alpha = 2, \beta = 9$

C. c)$\alpha = 2, \beta = 18$

D. d)none of these.

Answer:

8. For any three sets A,B and C,if $A \cap C = B \cap C$ and $A \cap C^c = B \cap C^c$ then show that A=B.

9. If $f(x) = a\dfrac{x-b}{a-b} + b.\dfrac{x-a}{b-a}$ then show that f(a)+f(b)=f(a+b).

10. Prove that (1+sec2A)(1+sec2^2A)(1+sec2^3A).....(1+sec2^nA)= (tan2^nA)/(tanA)`

11. Prove that ,$\tan(\alpha + \beta)\tan(\alpha - \beta) = \dfrac{\sin^2 \alpha - \sin^2 \beta}{\cos^2 \alpha - \sin^2 \beta}$

12. How many 5 digit numbers can be formed using the digits 0,2,5,6,7 without repeating the digits?

13. Show that , $\left(\dfrac{1+i}{1-i}\right)^2 + \left(\dfrac{1-i}{1+i}\right)^2$ is a real number.

14. Find the distance between the lines 3x+4y=9 and 6x+8y+15=0.

15. Find the value of : $\lim\limits_{x \to 0} \dfrac{\sin 2x + \sin 6x}{\sin 5x - \sin 3x}$

16. In an examination 60% passed in mathematics,68% passes in statistics and 52% passed in both the subjects.If 42 candidates failed in both the subjects,then find the total no.of candidates,appeard in the examinations(Using the concept of set).

17. If $\alpha \neq \beta$ and $a\tan\alpha + b\tan\beta = (a+b)\tan\left(\dfrac{\alpha+\beta}{2}\right)$, then show that $\dfrac{\cos\alpha}{\cos\beta} = \dfrac{a}{b}$

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18. For any three sets A,Band C show that :

$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

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19. Prove using principle of mathematical induction that sum of the cube three consecutive natural number is divisible by 9.

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20. If w be a imaginary cube root of uniyt and a+b+c=0 then show that

$\left(a + bw + cw^2\right)^3 + \left(a + bw^2 + cw\right)^3 = 27abc$

21. Find the sum upto n terms of the following series 4+44+444+....n.

22. Show that the straight lines 5x-y=6,x+5y-22=0,5x-y-32=0 and x+5y+4=0

form a square.

23. Find the value of : $\lim\limits_{x \to a} \dfrac{x \sin a - a \sin x}{x - a}$

24. Prove that :cot(A-B)cot(B-c)+cot(B-c)cot(C-A)+cot(A-B)cot(B-C)=1

25.   Provethat:

$$\frac{\cos 3\theta}{\sin 2\theta \sin 4\theta} + \frac{\cos 5\theta}{\sin 4\theta \sin 6\theta} + \frac{\cos 7\theta}{\sin 6\theta \sin 8\theta} = \frac{1}{2\sin \theta}(\cos ec2\theta - \cos ec8\theta)$$

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26. Two parallel straight lines contains 5 points and 10 points respectively.How many triangles can be formed using these points as the vertices of the triangles?

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27. Find the sum of the following series (1)+(2+3)+(4+5+6)+(7+8+9+10)+... to n terms.

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28. If ab+bc+ca=0 then prove that the straight lines x/a+y/b=1/c,x/b+y/c=1/aand x/c+y/a=1/b are concurrent.

29. Evaluate $\lim\limits_{x \to \pi/4} \dfrac{4\sqrt{2} - (\cos x + \sin x)^5}{1 - \sin 2x}$