



MATHS

BOOKS - MAXIMUM PUBLICATION

SOLVED PAPER 18

Example

1. If $A = \{2, 3, 4, 5\}$ and $B = \{4, 5, 6, 7\}$, then write $A \cup B$.



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2. If $A = \{2, 3, 4, 5\}$ and $B = \{4, 5, 6, 7\}$, then write $A \cap B$.



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3. Which one of the following is equal to

$\{x : x \in R, 2 < x \leq 4\}$ a) $\{2,3,4\}$ b) $\{3,4\}$ c) $\{2,4\}$
d) $\{2,3\}$

A. $\{2,3,4\}$

B. {3,4}

C. {2,4}

D. {2,4}

Answer: D



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4. Consider the set $A = \{x : x \text{ is an integer}$

$0 \leq x < 4\}$. Write A in Roster form.



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5. Consider the set $A = \{x : x \text{ is an integer } 0 \leq x < 4\}$. If $B = \{5, 6\}$, then write $A \times B$

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6. Prove that
$$\frac{\cos 9x - \cos 5x}{\sin 17x - \sin 3x} = \frac{-\sin 2x}{\cos 10x}.$$

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7. Evaluate:
$$\lim_{x \rightarrow 0} \frac{\cos 9x - \cos 5x}{\sin 17x - \sin 3x}$$

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8. Solve the inequality

$$\frac{x}{2} \geq \frac{5x - 2}{3} - \frac{7x - 3}{5}$$



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9. Find the Polar form of the complex number

$$\frac{1 + i}{1 - i}$$



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10. How many terms of the GP $3, \frac{3}{2}, \frac{3}{4}, \dots$ are needed to give the sum $\frac{3069}{512}$?



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11. Consider the real valued function

$$f(x) = \frac{x - 3}{x^2 - x - 6}$$

Find the domain of $f(x)$.



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12. Consider the real valued function

$$f(x) = \frac{x - 3}{x^2 - x - 6}$$

$$\lim_{x \rightarrow 3} f(x).$$



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13. If $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$,

$A = \{2, 4, 6, 8\}$, $B = \{2, 3, 5, 7\}$. Verify

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



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14. If A and B are two disjoint sets, with $n(A) = 4$ and $n(B) = 2$, then $n(A - B) = \dots\dots$



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15. Consider the statement

$$P(n) : 1 + 3 + 3^2 + \dots + 3^{n-1} = \frac{3^n - 1}{2}$$

.Show that P(1) is true



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16. Consider the statement

$$P(n) : 1 + 3 + 3^2 + \dots + 3^{n-1} = \frac{3^n - 1}{2}$$

.Prove by principle of mathematical

induction, that $P(n)$ is true for all $n \in \mathbb{N}$



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17. Solve the following inequalities graphically:

$$2x + y \geq 4.$$



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18. Solve the following inequalities graphically:

$$x + y \leq 3.$$



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19. Solve the following inequalities graphically:

$$2x - 3y \leq 6.$$



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20. Find the square roots of the complex number $(3 + 4i)$



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21. Insert five numbers between 8 and 26 such that the resulting sequence is an AP.



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22. Find the sum to n terms of the series

$$1 \times 2 + 2 \times 3 + 3 \times 4 + \dots$$



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23. Find the equation of the perpendicular bisector of the line joining the points $(0, 0)$ and $(-3, 4)$.



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24. Find the coordinate of the points on the line $y = 3x - 2$ that is equidistant from $(0,0)$ and $(-3,4)$.



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25. Reduce the equation $x - y = 4$ into normal form.



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26. Write the distance of line $x - y = 4$ from origin.



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27. Find the derivative of $f(x) = x \sin x$ with respect to x .



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28. Find the derivative of the function $y = \sqrt{x}$ with respect to x by using first principles.



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29. Consider the point $A(3, 8, 10)$ and $B(6, 10, -8)$. Find the ratio in which the line segment joining A and B is divided by the YZ coordinate plane.



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30. Write the contrapositive of the statement:

“If the integer n is odd, then n^2 is odd.”



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31. Prove by the method of contradiction :

$\sqrt{7}$ is irrational.”



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32. If $\left(\frac{x+3}{2}, \frac{y-1}{3}\right) = (4, 2)$, find the value

of x and y .



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33. Consider the function $f(x) = |x| - 3$

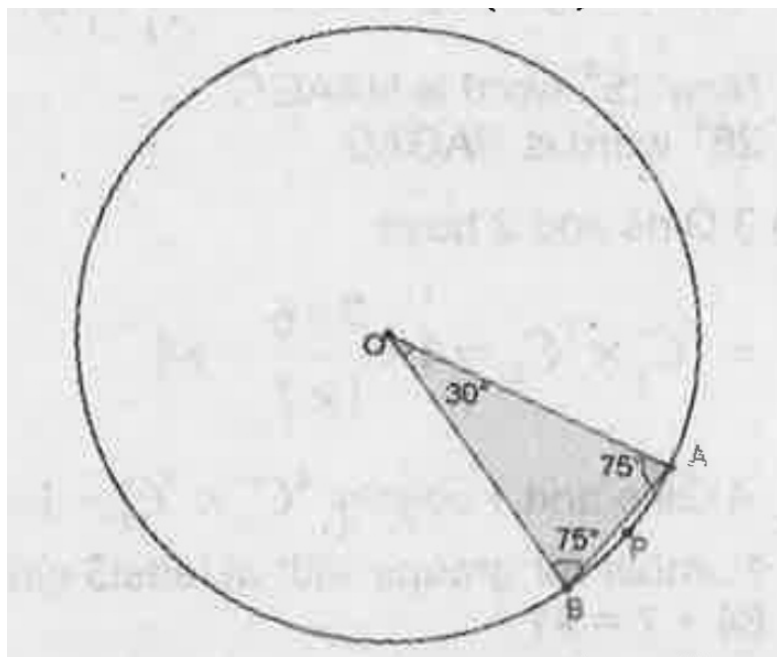
draw the graph of $f(x)$



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34. In the given figure radius of the circle is 2 units. Find the length of arc APB .

APB .



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35. Find the number of words with or without meaning, which can be made by using all the letters of the word 'GANGA'.



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36. A group consists of 4 girls and 7 boys. In how many ways, can a team of 5 members be selected if the team should have at least 3 girls?



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37. Write the expansion of $(a + b)^n$.



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38. Find the coefficient of x^5y^7 in the expansion of $(x - 2y)^{12}$.



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39. Show that $9^{n+1} - 8n - 9$ is divisible by 64.

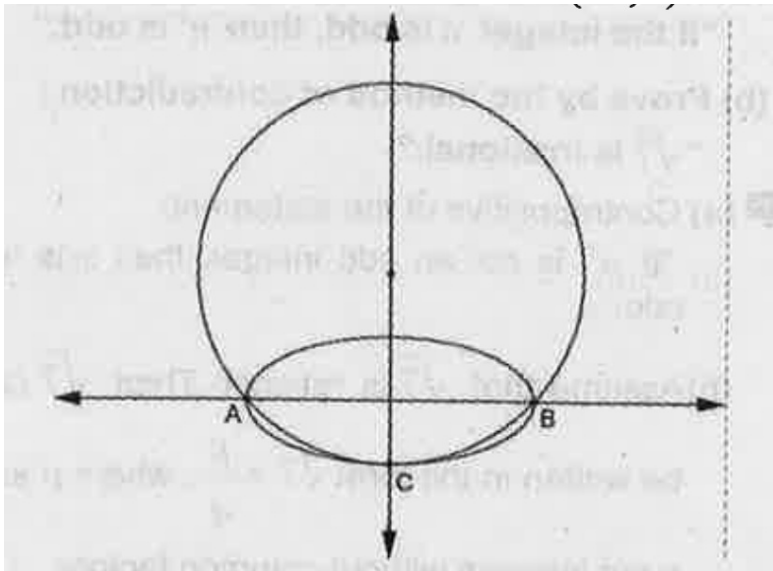




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40. Foci of the ellipse in the given figure are $(\pm \sqrt{12}, 0)$ and vertices are $(\pm 4, 0)$

Find the equation of the ellipse.



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41. Consider the following table:

Find the arithmetic' mean of marks given In the above data.



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42. Consider the following table:

Find the standard deviation of marks in the above data.



43. Consider the following table:

Find the coefficient of variation.

Marks obtained	10-20	20-30	30-40	40-50
Number of students	2	3	8	14
	50-60	60-70	70-80	
	8	3	2	

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44. Consider the experiment in which a coin is tossed repeatedly until a head comes up.

Write the sample space.



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45. If A and B are two events of a sample space with $P(A) = 0.54$, $P(B) = 0.60$ and $P(A \cap B) = 0.35$. Find $P(A' \cap B')$.



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46. 3 cards are drawn from a well shuffled pack of 52 cards. Find the probability that all the 3

cards are diamond.



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47. 3 cards are drawn from a well shuffled pack of 52 cards. Find the probability that

At least one of the cards is non diamond.



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48. 3 cards are drawn from a well shuffled pack of 52 cards. Find the probability that

One card is king and two are jacks.



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