



# MATHS

# **BOOKS - S CHAND MATHS (ENGLISH)**

### **MODEL TEST PAPER -2**



1. A set B is given as B = {1,2}. Some elements of  $A \times B$  are (3,1), (5,1) and

(7,2) . Find the remaining elements of A imes B such that n(A imes B) is least



**2.** An arc 15 ft long describes an angle of 5 radians at the centre of a circle. Find the radius of the circle

3. If A, B, C, D are angles of a cyclic quadrilateral, then prove that cos A +

 $\cos B + \cos + \cos D = 0$ 



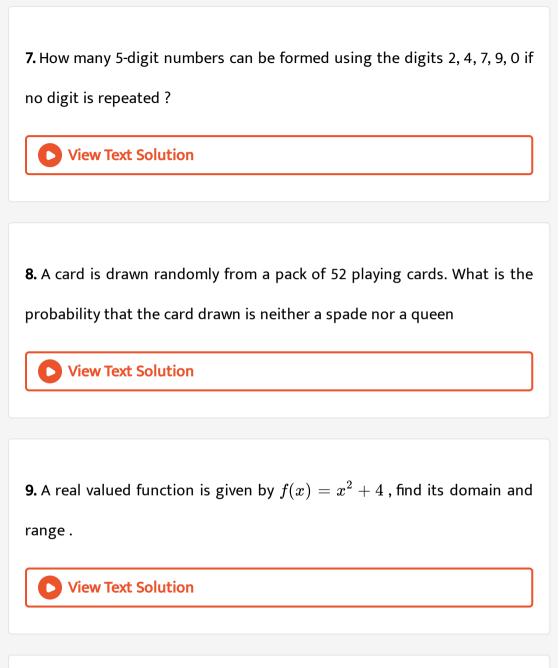
4. If 
$$f(x)=3\sqrt{\left(1+x^2
ight)^4}$$
 , find f'(1)

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5. Evaluate : 
$$\sin^2 24^\circ - \sin^2 6^\circ$$

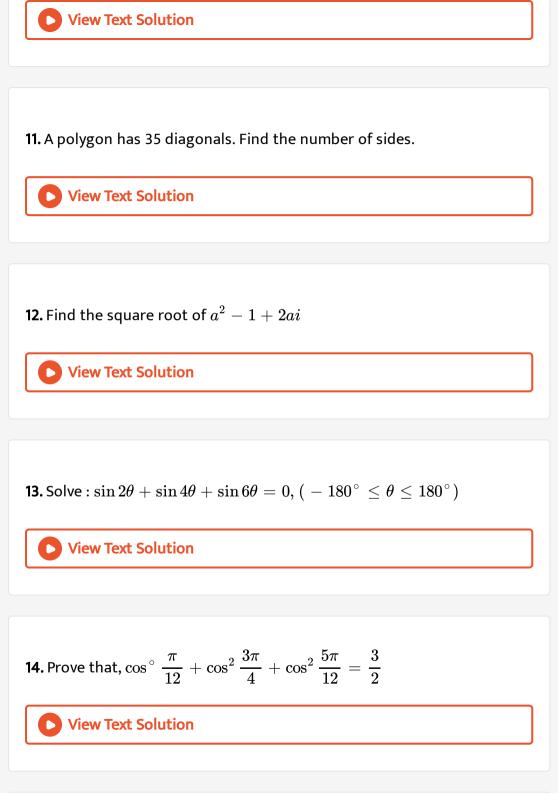
**6.** Find the condition for the equation  $ax^2 + bx + c = 0$  , so that one root is m times the other.

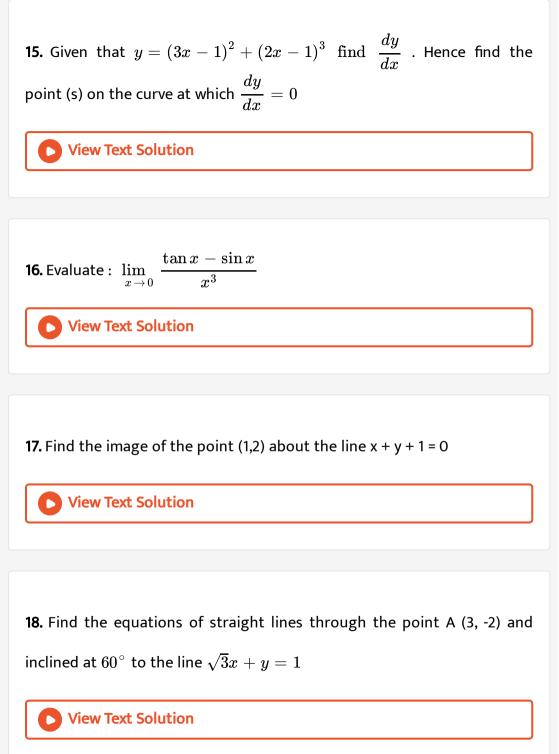




10. Let A = {1, 2, 3}, B = {4, 5, 6, 7} and let f = {(1, 4), (2,5), (3,6)} be a function

from A to B . Show that f is one - one but not onto





**19.** Find the  $6^{th}$  term from the end in the expansion of  $\left(2x-rac{1}{x^2}
ight)^n$  if

$$C_0 + C_1 + C_2 + \ldots + C_n = 1024$$

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**20.** If 
$$\tan \frac{\alpha}{2}$$
 and  $\tan \frac{\beta}{2}$  are the roots of the equation  
 $8x^2 - 26x + 15 = 0$  then find the value of  $\cos (\alpha + \beta)$ 

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21. If 
$$rac{\cos x}{\cos(x-2y)}=\lambda$$
 then show that tan (x - y)  $=\left(rac{1-\lambda}{1+\lambda}
ight)$  cot y

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**22.** If a, b, c are in AP, b, c, d are in GP and  $\frac{1}{c}, \frac{1}{d}, \frac{1}{e}$  are in AP , Prove that

a, c, e are in Gp

**23.** Find the terms are in GP such that their sum is  $\frac{11}{2}$  and product is 32

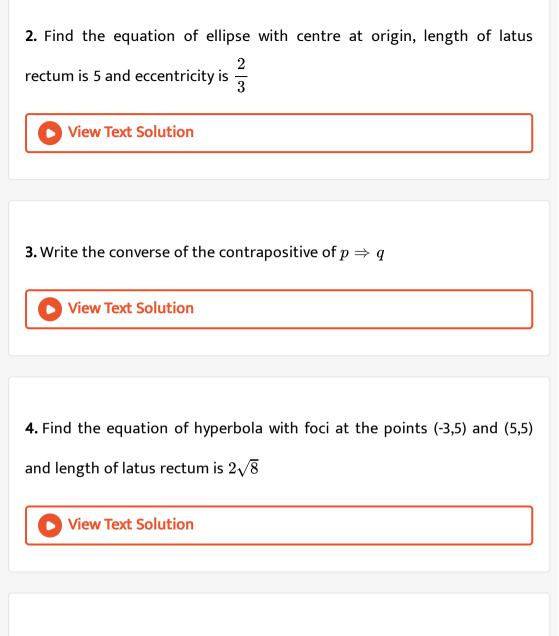


**24.** Find the values of  $f_1$ ,  $f_2$  and  $f_3$  from the following data : Class Interval 0 - 10 10 - 20 20 - 30 30 - 40 40 - 50 50 - 60 60Frequency 4 16  $f_1$   $f_2$  40  $f_3$ Given that median = 33.5, mode = 34 and total frequency is 230

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#### Section **B**

1. Construct truth table for  $\sim [pA(\sim q)]$  and find which implication has same truth value .



**5.** Reduce the following equation of parabola to a standard form hence find the vertex , focus and the equations of latus rectum

$$4x - y^2 + 2y - 13 = 0$$



6. Using section formula, prove that three points A (-2, 3, 5), B (1, 2, 3) and

(7, 0, -1) are collinear

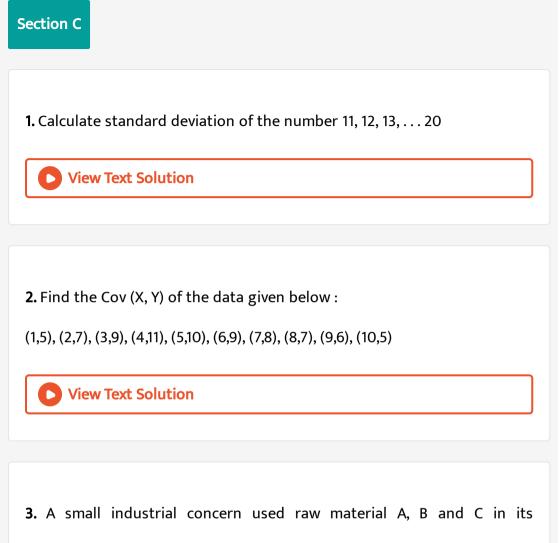


7. The midpoint of the sides of a triangle are 
$$\left(3, 2, \frac{3}{2}\right), \left(1, \frac{3}{2}, 3\right)$$
 and  $(2, (5), (2), (5), (2))$  Find the coordinates of

centroid

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**8.** Does the straight line 
$$\frac{x}{a} + \frac{y}{b} = 2$$
 touch the ellipse  $\left(\frac{x}{a}\right)^2 + \left(\frac{y}{b}\right)^2 = 2$ ? If it touches, find the coordinates of the point of contact



manufacturing process . The prices of the materials are as shown below :

	2006	2016		
A	,4	5		
B	60	- 57		
Ċ	36	42		

Using 2006 as the base year, calculate for 2016 a simple aggregate price

index

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4. Calculate Spearman's coefficent of rank correlation from the following

data and interpret the result.

X	16	19	22	28	25	31	37	40	43	49
Y	25	25	27	31	27	33	35	41	45	41

5. The mathematical aptitude score of 10 computer programmers with

their job performance is given below :

Mathematics score7514302689Job performance rating8168954381712

Calculate the Karl Pearson's correlation coefficient and interpret the result.

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**6.** From a frequency distribution consisting of 18 observations, the mean and standard deviation were found to be 7 and 4 respectively. But on comparison with original data, it was found that a figure 12 was miscopied as 21 in calculations. Calculate the correct mean and standard deviation.

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**7.** Find the inter-quartile range, semi inter-quartile range and coefficient of quartile deviation from the following frequency distribution

Marks	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
No. of students	60	45	120	25	90	80
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8. The following table gives the quarterly death rate per thousand of a

city for the years 1953 to 1955

Year	March	June	September	December
1953	13.9	10.3	8.1	10.6
1954	13.8	9.8	7.8	10.8
1955	14.2	10.1	7.8	10.0

Plot these figures on a graph. Calculate the suitable moving averages and

plot them on the same graph