



## MATHS

### BOOKS - VK GLOBAL PUBLICATION MATHS (HINGLISH)

### MODEL QUESTION PAPER -2 [UNSOLVED]

#### Section B

1. Without using trigonometric tables, find the value of the following:

$$\left( \frac{\tan 20^\circ}{(\operatorname{cosec} 70^\circ)^2} \right) + \left( \frac{\cot 20^\circ}{(\sec 70^\circ)^2} \right) + 2 \tan 15^\circ \tan 45^\circ \tan 75^\circ$$



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2. What would be the area of a circle whose circumference is 22 cms. ?

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3. What would be the area of a circle whose circumference is 22 cms. ?

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## Section C

1. Show that  $5 - 2\sqrt{3}$  is an irrational number.

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2. What is the quotient and remainder, when

$3x^4 + 5x^3 - 7x^2 + 2x + 2$  is divided by  $x^2 + 3x + 1$ .

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3. Solve for x and y:

$$\left. \begin{array}{l} \frac{5}{x} + \frac{1}{y} = 2 \\ \frac{6}{x} - \frac{3}{y} = 1 \end{array} \right\} x, y \neq 0$$

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4. Determine an AP whose 3rd term is 16 and when 5th term

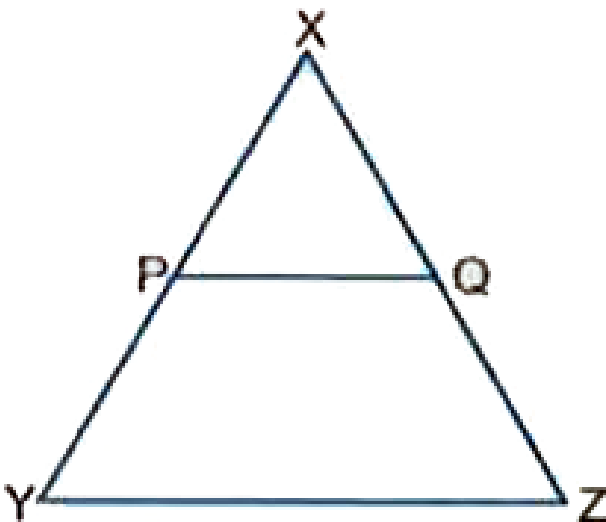
is subtracted from 7th term, we get 12.

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5. For what value of  $k$  the points  $A(1, 5)$ ,  $B(k, 1)$  and  $C(4, 11)$  are collinear?

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6. In Fig. 3, given,  $XP/PY = XQ/QZ = 3$ . If the area of  $\triangle XYZ$  is  $32\text{cm}^2$ , then find the area of the quadrilateral  $PYZQ$ .





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7. A circle touches the side  $BC$  of a  $\triangle ABC$  at a point  $P$  and touches  $AB$  and  $AC$  when produced at  $Q$  and  $R$  respectively. Show that  $AQ = \frac{1}{2}(\text{Perimeter of } \triangle ABC)$ .



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8. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting  
Non face card



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9. One card is drawn from a well shuffled deck of 52 cards.

Find the probability of getting

Black king or a Red queen

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10. One card is drawn from a well shuffled deck of 52 cards.

Find the probability of getting

Spade card.

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11. Find the missing frequency  $f$  if the mode of the given data is 154.

Class interval	120-130	130-140	140-150	150-160	160-170	170-180
Frequency	2	8	12	$f$	8	7



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## Section D

1. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream then to return downstream to the same spot. Find the speed of the stream.



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2. Prove that in a triangle, if the square of one side is equal to the sum of the squares of the other two sides, the angle opposite to the first side is a right angle. Using the converse of above, determine the length of an altitude of an equilateral triangle of side 2 cm.



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3. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of  $60^\circ$  to each other.



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4. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of  $60^\circ$  to each other.



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5. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of  $60^\circ$  to each other.





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6. Draw a circle of radius 4 cm. Draw two tangents to the circle inclined at an angle of  $60^\circ$  to each other.

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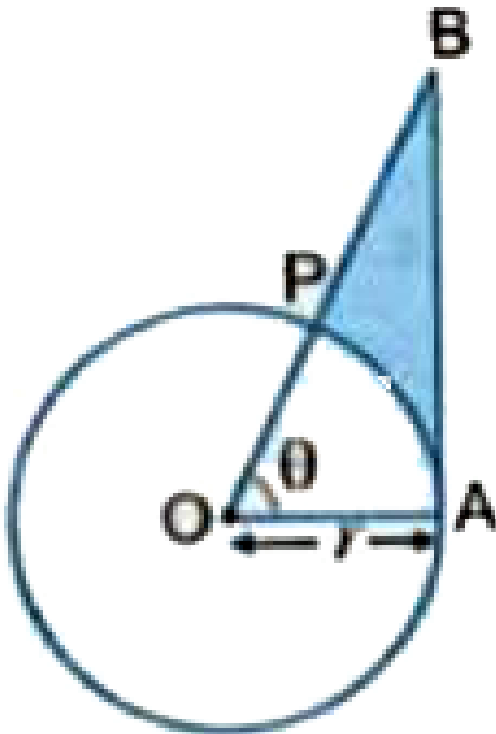
7. A fire at a building A is reported on telephone to two fire stations  $F_1$  and  $F_2$ , 10 km apart from each other on a straight road.  $F_1$  observes that the fire is at an angle of  $60^\circ$  to the road and  $F_2$  observes that it is at angle of  $45^\circ$  to the road. A or  $d \in g \rightarrow$  decision by higher authority or its station  $F_1$  sends its team.

) Which value is depicted in the decision of higher authority?

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8. In Fig. 4, a sector OAP of a circle with centre O, containing  $\angle \theta$ . AB is perpendicular to the radius OA and meets OP produced at B. Prove that the perimeter of shaded region is  $r$ .

$$\left[ \tan \theta + \sec \theta + \frac{\pi \theta}{180^\circ} - 1 \right]$$



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9. A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

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10. Find the mean, mode and median for the following data:

Classes	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	4	8	10	12	10	4	2

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