

APOLLO

FBISE Mathematics Class 12

Topical workbook - Volume 3 of 3

17 questions arranged by official framework topic.

National Curriculum 2022-23; supported examinations from 2027.

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Equations of Tangent and Normal

Domain B: Geometry

(xi)	Find equation of tangent to $y^2 = 12x$ through the point (1,4)	04
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OR

$$\frac{x^2}{128} + \frac{y^2}{18} = 1 \text{ which are parallel to the line } 3x + 8y + 1 = 0.$$

08

Also find the point of contact.

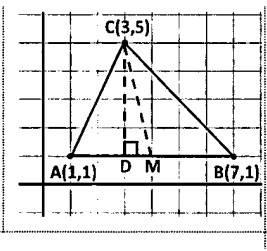
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Ellipse

Domain B: Geometry

In the given $\triangle ABC$ find equation of:

- a. Median $\overline{CM}$
- b. Altitude $\overline{CD}$
- c. Right bisector of $\overline{AB}$ at mid-point M



08

OR

In an elliptic ground $b = \frac{1}{2}a$ and $a = 8$ find:

- a. Vertices and co-vertices
- b. Foci
- c. Eccentricity
- d. Equation in standard form with centre at origin
- e. Draw the rough diagram of ellipse using vertices and co-vertices only. (Graph paper is not required)

2+2+2
+1+1

(xii)	Find equation of an ellipse with foci $(\pm 2, 0)$ and vertices $(\pm 3, 0)$.	04
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(xi)	A whispering gallery (elliptical) has a ceiling height of 8 m at center and width 20 m. Where are the foci located?	04
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A satellite orbits Earth in an elliptical path with Earth's center at one focus. Major axis length = 30,000 km, minor axis length = 20,000 km. Find distance from Earth's center to ellipse center.	04
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04

(xi)	Find an equation of the ellipse having centre at $(0,0)$, Focus at $(0,-3)$ and one vertex at $(0,4)$.	04
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04

For the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$, length of the major axis is:	3	4	6	8
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Find the equation of an ellipse with center at $(2, -3)$, major axis parallel to the x-axis, length of major axis = 10 units, and length of minor axis = 6 units.

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Standard Form of Equation of Hyperbola

Domain B: Geometry

OR	A hyperbola of eccentricity $\frac{5}{2}$ has one focus at $(1,-4)$. The corresponding	4
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the stone.		directrix is the line $y = 2$. Find equation of the hyperbola.
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04	OR	$\frac{dx}{x^2 - \frac{y^2}{4}} = 1$ is an equation of hyperbola then find: a. Centre b. Vertices c. Foci d. Equation of asymptotes	04
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xvi.	Equations of the asymptotes of a hyperbola $\frac{x^2}{7^2} - \frac{y^2}{4^2} = 1$ are:	$y = \pm \frac{4}{7}$	$y = \pm \frac{7}{4}$	$x = \pm \frac{4}{7}$	$x = \pm \frac{7}{4}$
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