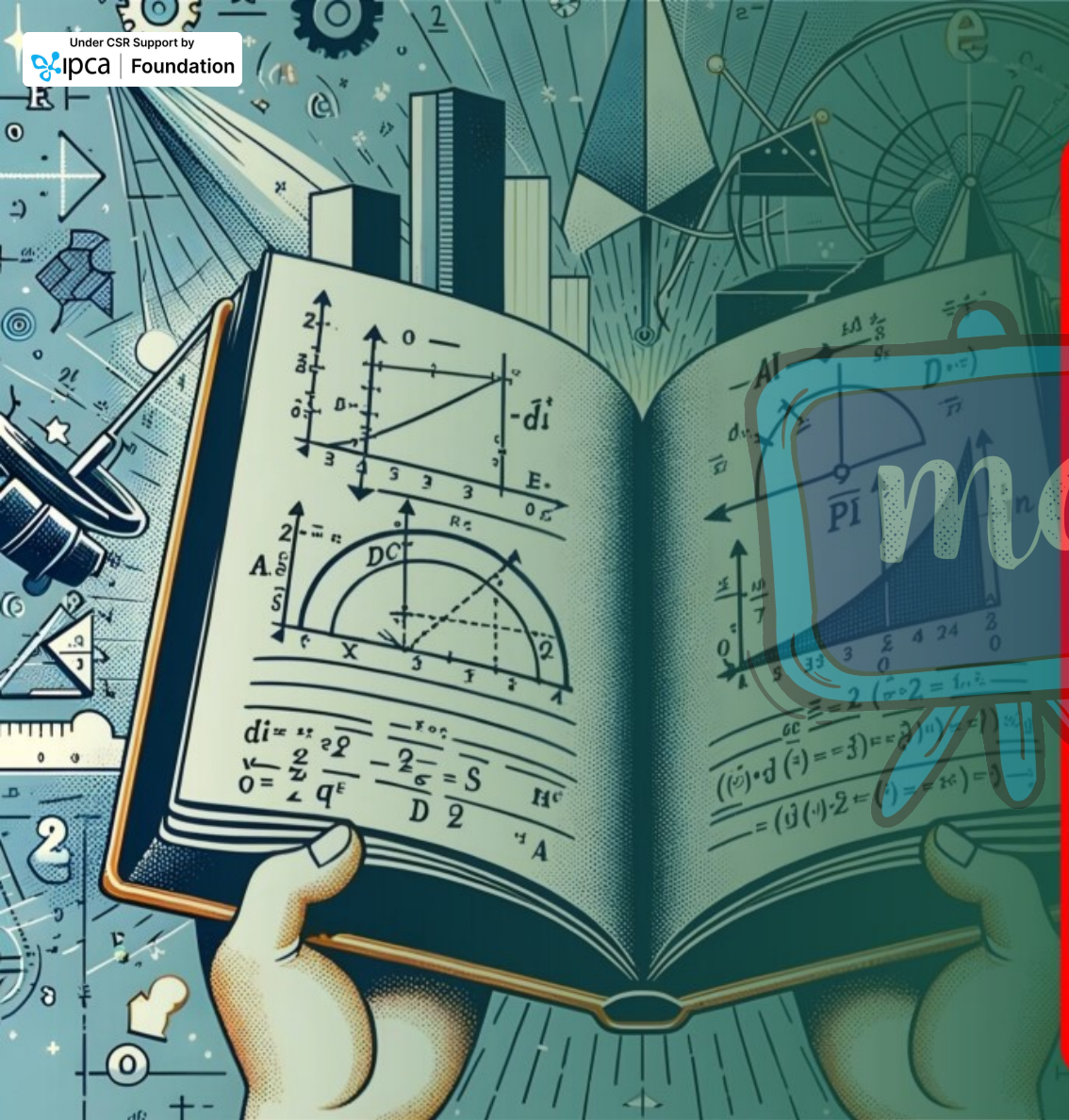


CLASS – 10

MATHEMATICS

CH – 8 : Introduction to Trigonometry

CBSE Board

Previous Year Questions – 1

Shubham Tiwari

1. If $2\tan A = 3$ then the value of $\frac{4\sin A + 3\cos A}{4\sin A - 3\cos A}$ is

(CBSE 2023)

$\tan A = \frac{3}{2}$

$\frac{4\sin A + 3\cos A}{\cos A}$

$\frac{4\sin A - 3\cos A}{\cos A}$

$= \frac{4\tan A + 3}{4\tan A - 3}$

$= \frac{4 \times 3/2 + 3}{4 \times 3/2 - 3} = \frac{9}{3}$

A. $\frac{7}{\sqrt{13}}$

B. $\frac{1}{\sqrt{13}}$

C. 3

D. does not exist

2. Given that $\cos\theta = \frac{\sqrt{3}}{2}$, then the value of $\frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta}$ is

(CBSE Term I ,2021–22)

$\cot\theta = \sqrt{3}/2$

$\theta = 30°$

$\frac{(2)^2 - (2/\sqrt{3})^2}{(2)^2 + (2/\sqrt{3})^2}$

$\frac{4 - 4/3}{4 + 4/3} = \frac{8/3}{16/3}$

A. -1

B. 1

C. $\frac{1}{2}$

D. $-\frac{1}{2}$

3. $\frac{1}{\operatorname{cosec}\theta(1-\cot\theta)} + \frac{1}{\sec\theta(1-\tan\theta)}$ is equal to

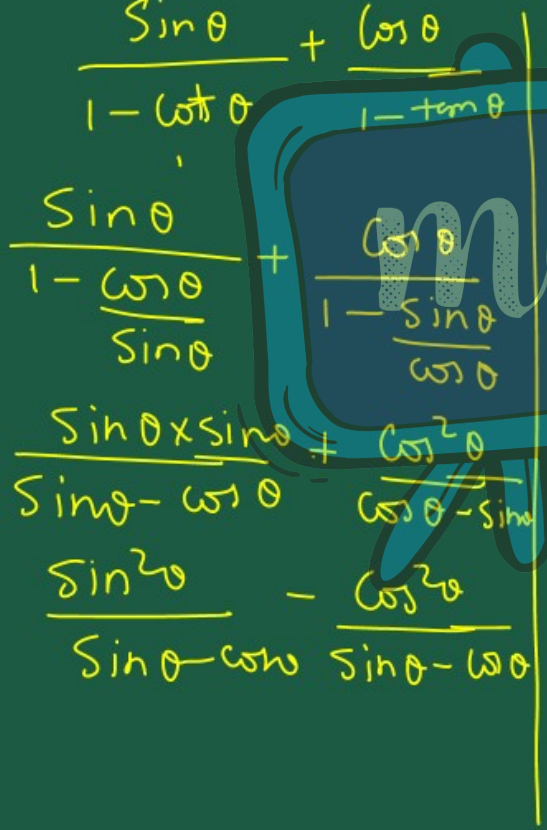
(CBSE Term I ,2021–22)

A. 0

B. 1

C. $\sin\theta+\cos\theta$

D. $\sin\theta-\cos\theta$



$$\frac{\sin^2\theta}{\sin\theta-\cos\theta}-\frac{\cos^2\theta}{\sin\theta-\cos\theta}$$

$$\frac{\sin^2\theta-\cos^2\theta}{\sin\theta-\cos\theta}$$

$$\frac{(\sin\theta-\cos\theta)(\sin\theta+\cos\theta)}{(\sin\theta-\cos\theta)}$$

$$\sin\theta+\cos\theta$$

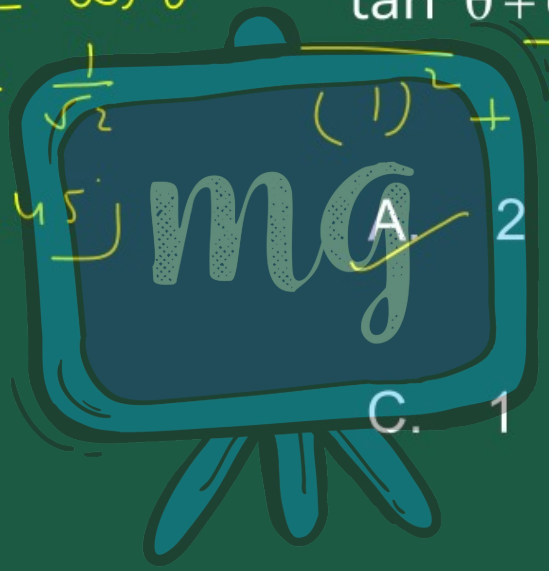
4. If $\sin\theta = \cos\theta$, then the value of $\tan^2\theta + \cot^2\theta$ is (CBSE 2020)

$\sin\theta = \cos\theta$

$\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

$\theta = 45°$

$(1)^2 + (1)^2$



A. 2

B. 4

C. 1

D. $\frac{10}{3}$

5. $\left[\frac{5}{8}\sec^2 60° - \tan^2 60° + \cos^2 45°\right]$ is equal to

(CBSE 2023)

A. $\frac{-5}{3}$

B. $\frac{-1}{2}$

C. 0

D. $\frac{-1}{4}$

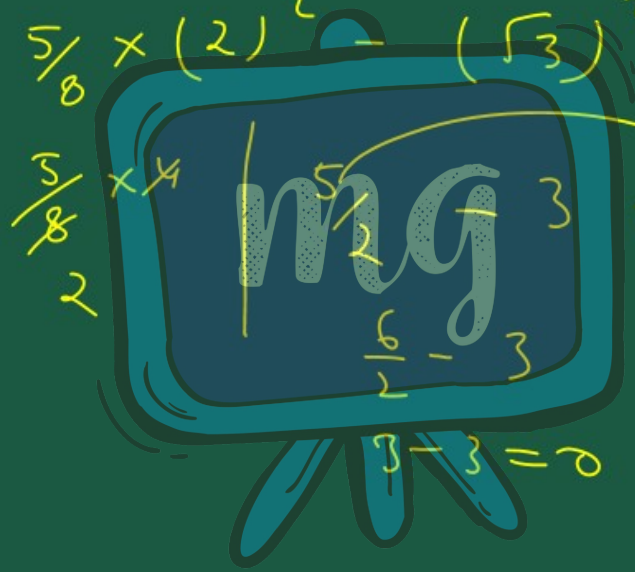
$$= \frac{5}{8}\left[\sec^2 60 - \tan^2 60 + \cos^2 45^\circ\right]$$

$$\frac{5}{8} \times (2)^2 - (\sqrt{3})^2 + \left(\frac{1}{\sqrt{2}}\right)^2$$

$$\frac{5}{2} \times 4 - 3 + \frac{1}{2}$$

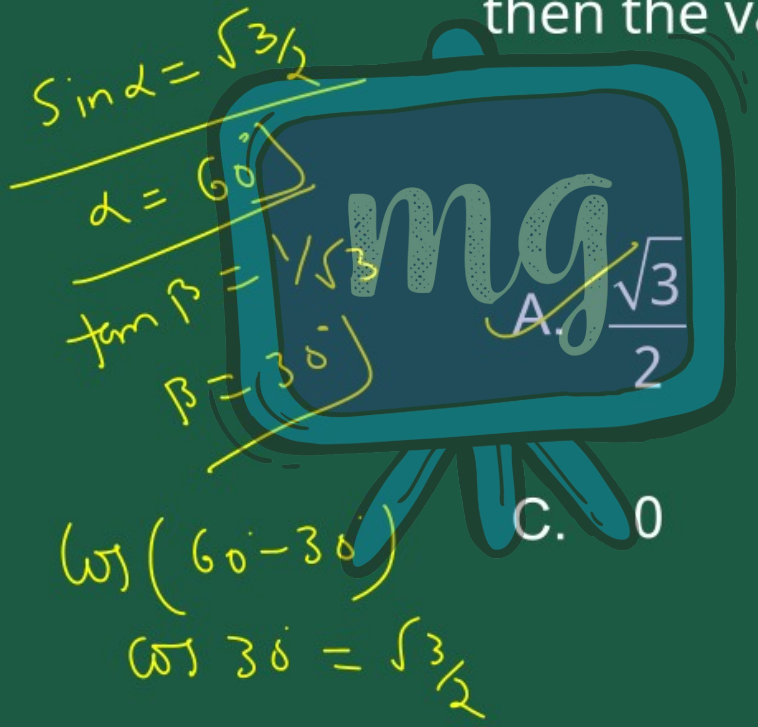
$$\frac{6}{2} - 3$$

$$3 - 3 = 0$$



6. Given that $\sin\alpha = \frac{\sqrt{3}}{2}$ and $\tan\beta = \frac{1}{\sqrt{3}}$, then the value of $\cos(\alpha - \beta)$ is

(CBSE Term I ,2021–22)



A. $\frac{\sqrt{3}}{2}$

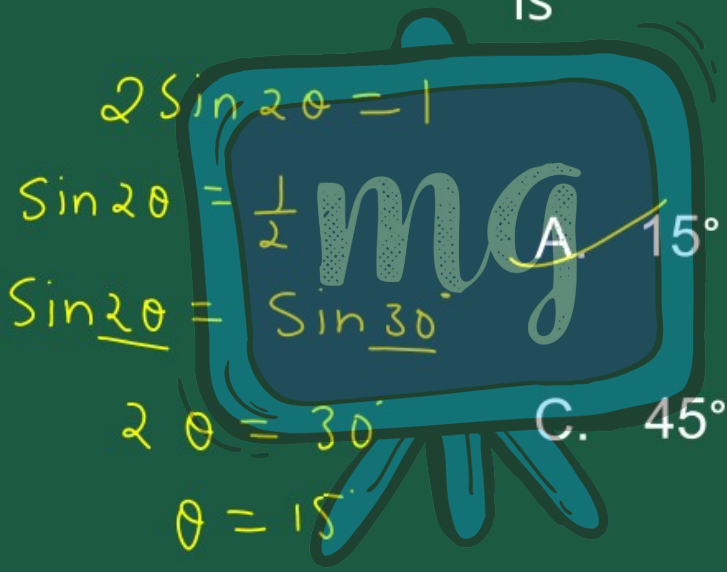
B. $\frac{1}{2}$

C. 0

D. $\frac{1}{\sqrt{2}}$

7. The value of θ for which $2\sin 2\theta = 1$ is

(CBSE Term I ,2021–22)



A. 15°

B. 30°

C. 45°

D. 60°

8. $(\sec^2\theta - 1)(\text{cosec}^2\theta - 1)$ is equal to

(CBSE 2023)

$\tan^2\theta \times \cot^2\theta$

$\frac{1}{\cot^2\theta} \times \cot^2\theta$

A. -1

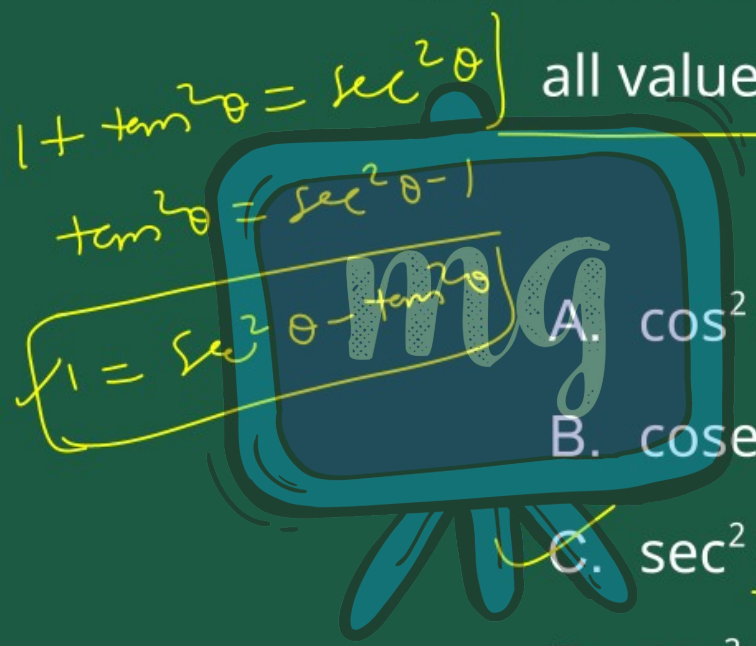
B. 1

C. 0

D. 2

9. Which of the following is true for all values of $\theta (0° \leq \theta < 90°)$?

(CBSE 2023)



A. $\cos^2\theta - \sin^2\theta = 1$

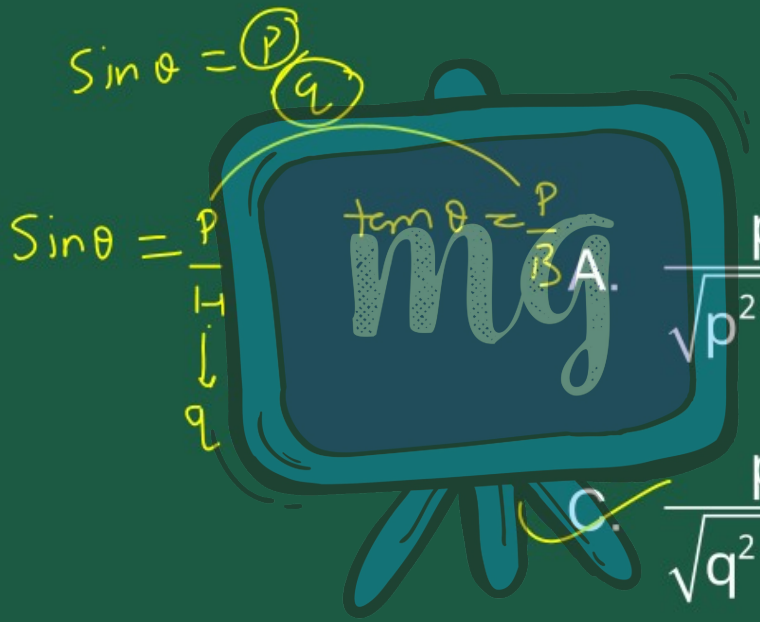
B. $\text{cosec}^2\theta - \sec^2\theta = 1$

C. $\sec^2\theta - \tan^2\theta = 1$

D. $\cot^2\theta - \tan^2\theta = 1$

10. Given that $\sin\theta = \frac{p}{q}$, $\tan\theta$ is equal to

(CBSE Term I ,2021–22)



A. $\frac{p}{\sqrt{p^2 - q^2}}$

B. $\frac{q}{\sqrt{p^2 - q^2}}$

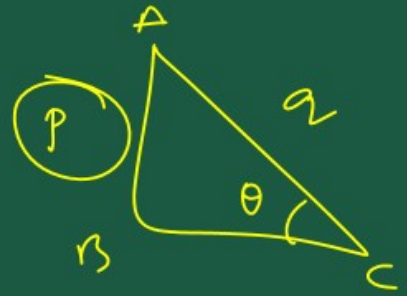
C. $\frac{p}{\sqrt{q^2 - p^2}}$

D. $\frac{q}{\sqrt{q^2 - p^2}}$

$\sin\theta = \frac{P}{q}$ | $\tan\theta$

$\tan\theta = \frac{P}{B}$

$= \frac{P}{\sqrt{q^2 - P^2}}$



$AC^2 = AB^2 + BC^2$

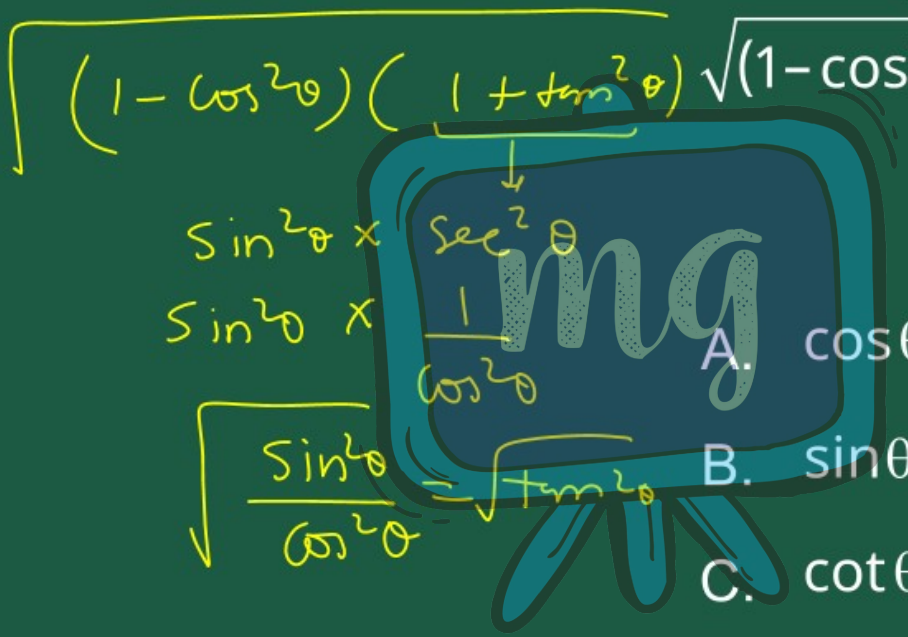
$AC^2 - AB^2 = BC^2$

$q^2 - P^2 = BC^2$

$\sqrt{q^2 - P^2} = BC$

11. The simplest form of $\sqrt{(1-\cos^2\theta)(1+\tan^2\theta)}$ is

(CBSE Term I, 2021-22)



A. $\cos\theta$

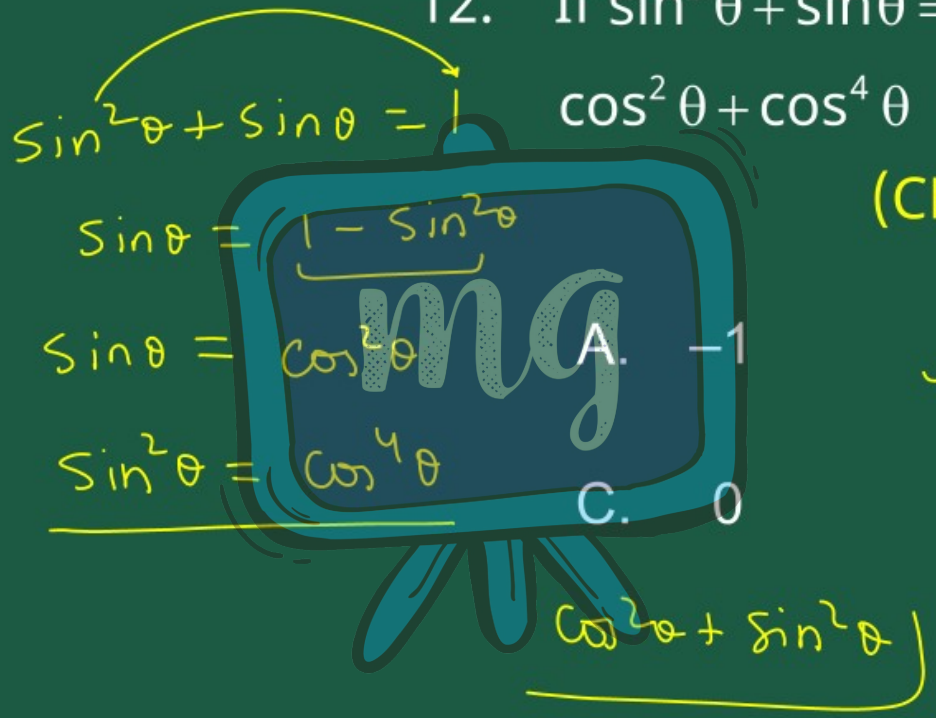
B. $\sin\theta$

C. $\cot\theta$

D. $\tan\theta$

12. If $\sin^2\theta + \sin\theta = 1$ then the value of $\cos^2\theta + \cos^4\theta$ is

(CBSE Term I ,2021–22)



A. -1

B. 1

C. 0

D. 2

13. The distance between the points $(a\cos\theta + b\sin\theta, 0)$ and $(0, a\sin\theta - b\cos\theta)$ is

(CBSE 2020)

A. $a^2 + b^2$

B. $a^2 - b^2$

C. $\sqrt{a^2 + b^2}$

D. $\sqrt{a^2 - b^2}$

(x_1, y_1) $\quad$ (x_2, y_2)

$(a\cos\theta + b\sin\theta, 0)$ $\quad$ $(0, a\sin\theta - b\cos\theta)$

Distance formula :- $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$$AB = \sqrt{\left[0 - (a\cos\theta + b\sin\theta)\right]^2 + \left[a\sin\theta - b\cos\theta - 0\right]^2}$$

$$= \sqrt{\left[a^2\cos^2\theta + b^2\sin^2\theta + 2ab\sin\theta\cos\theta + a^2\sin^2\theta + b^2\cos^2\theta - 2ab\sin\theta\cos\theta\right]}$$

$$\sqrt{a^2(\sin^2\theta + \cos^2\theta) + b^2(\sin^2\theta + \cos^2\theta)}$$