



The system of linear equations  $x + y + z = 2$  ;  $2x + 3y + 2z = 5$  ;  
 $2x + 3y + (a^2 - 1)z = a + 1$

Solution:  $x + y + z = 2$

$$2x + 3y + 2z = 5$$

$$2x + 3y + (a^2 - 1)z = a + 1$$

$$\Delta = \begin{vmatrix} 1 & 1 & 1 \\ 2 & 3 & 2 \\ 2 & 3 & a^2 - 1 \end{vmatrix} \quad R_3 \rightarrow R_3 - R_2 \Rightarrow \begin{vmatrix} 1 & 1 & 1 \\ 2 & 3 & 2 \\ 0 & 0 & a^2 - 3 \end{vmatrix} = 0$$
$$\Rightarrow |a| = \sqrt{3}$$

$$x + y + z = 2$$

For  $|a| = \sqrt{3}$ , Equations become:  $2x + 3y + 2z = 5$

$$2x + 3y + 2z = \pm\sqrt{3} + 1$$

Inconsistent system

A

Has a unique solution for  
 $|a| = \sqrt{3}$

B

Is inconsistent for  $|a| = \sqrt{3}$

C

Has infinitely many solutions  
for  $a = 4$

D

Is inconsistent for  $a = 4$