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1. The angle between  $A = \hat{i} + \hat{j}$  and  $B = \hat{i} - \hat{j}$  is

1)  $180^\circ$

2)  $-45^\circ$

3)  $90^\circ$

4)  $45^\circ$

**Sol.** 3)  $90^\circ$

$$\cos(\theta) = \frac{\vec{A} \cdot \vec{B}}{|\vec{A}| |\vec{B}|} = \frac{(\hat{i} + \hat{j}) \cdot (\hat{i} - \hat{j})}{|\sqrt{1^2 + 1^2}| |\sqrt{1^2 + (-1)^2}|} = \frac{1 - 1}{2} = 0$$

$$\theta = \cos^{-1}(0) = \frac{\pi}{2} \text{ or } 90^\circ$$