

**Seven Different Possible Scenarios of Finding the area of Cumulative
Standard Normal Distribution.**

1. $P(Z < a)$

See Direct from Table

2. $P(Z > a)$

$$= 1 - P(Z < a)$$

See from Table

3. $P(Z < -a)$

$$= 1 - P(Z < a)$$

See from Table

$$\mathbf{4. } P(Z > -a)$$

$$= 1 - P(Z < -a)$$

$$= 1 - [1 - P(Z < a)]$$

$$= P(Z < a)$$

See Direct from Table

$$\mathbf{5. \textit{P}(a < Z < b)}$$

$$= P(Z < b) - P(Z < a)$$

See from Table

$$\mathbf{6. \textit{P}(-a < Z < -b)}$$

$$= P(Z < -b) - P(Z < -a)$$

$$= [1 - P(Z < b)] - [1 - P(Z < a)]$$

$$= P(Z < a) - P(Z < b)$$

See from Table

$$\mathbf{7. \textit{P}(-a < Z < b)}$$

$$= P(Z < b) - P(Z < -a)$$

$$= P(Z < b) - [1 - P(Z < a)]$$

$$= P(Z < b) + P(Z < a) - 1$$

See form Table

A Case of Scenario 7.

$$\mathbf{7(a). } P(|Z| < a)$$

$$= P(-a < Z < a)$$

$$= P(Z < a) - P(Z < -a)$$

$$= P(Z < a) - [1 - P(Z < a)]$$

$$= P(Z < a) - 1 + P(Z < a)$$

$$= 2[P(Z < a)] - 1$$

See from Table

Mixture of Scenario 2 and 3

$$P(|Z| > a)$$

$$= P(Z < -a \text{ or } Z > a)$$

$$= P(Z < -a) + P(Z > a)$$

$$= 1 - P(Z < a) + [1 - P(Z < a)]$$

$$= 2 - 2P(Z < a)$$

See from Table

OR

$$= P(Z < -a) + P(Z < -a)$$

$$= 2P(Z < -a)$$

See from Table