

# NORMAL DISTRIBUTION: SUMMARY OF FORMULAS\*

Susan Dean  
Barbara Illowsky, Ph.D.

This work is produced by OpenStax-CNX and licensed under the Creative Commons Attribution License 3.0<sup>†</sup>

**Formula 1:** Normal Probability Distribution

$$X \sim N(\mu, \sigma)$$

$\mu$  = the mean       $\sigma$  = the standard deviation

**Formula 2:** Standard Normal Probability Distribution

$$Z \sim N(0, 1)$$

$z$  = a standardized value (z-score)

mean = 0      standard deviation = 1

**Formula 3:** Finding the kth Percentile

To find the **kth** percentile when the z-score is known:  $k = \mu + (z)\sigma$

**Formula 4:** z-score

$$z = \frac{x - \mu}{\sigma}$$

**Formula 5:** Finding the area to the left

The area to the left:  $P(X < x)$

**Formula 6:** Finding the area to the right

The area to the right:  $P(X > x) = 1 - P(X < x)$

---

\*Version 1.5: May 31, 2012 7:49 am +0000

<sup>†</sup><http://creativecommons.org/licenses/by/3.0/>