

Normal Curve

Interpreting Scores



	Chris's Score
Quiz1	35
Quiz2	45
Homework	70
Exam	70

Interpretation relative to mean

	Chris's Score	Class Mean
Quiz1	35	35
Quiz2	45	50
Homework	70	65
Exam	70	65

Include Standard Deviation

	Chris's Score	Class Mean	Class SD	Interpretation
Quiz1	35	35 $x = \bar{x}$	5	$\frac{35 - 35}{5} = 0$
Quiz2	45	50	3	$\frac{45 - 50}{3} = -1.67$
Homework	70	65	10	$\frac{70 - 65}{10} = .50$
Exam	70	65	2	$\frac{70 - 65}{2} = 2.50$

Z-scores and raw scores

$$Z = \frac{x - \bar{x}}{s}$$

$$x = zS + \bar{x}$$

Standard Scores

	Chris's Score	Class Mean	Class SD	Z-score
Quiz1	35	35	5	0
Quiz2	45	50	3	-1.67
Homework	70	65	10	.50
Exam	70	65	2	2.5

Properties of the Normal Distribution

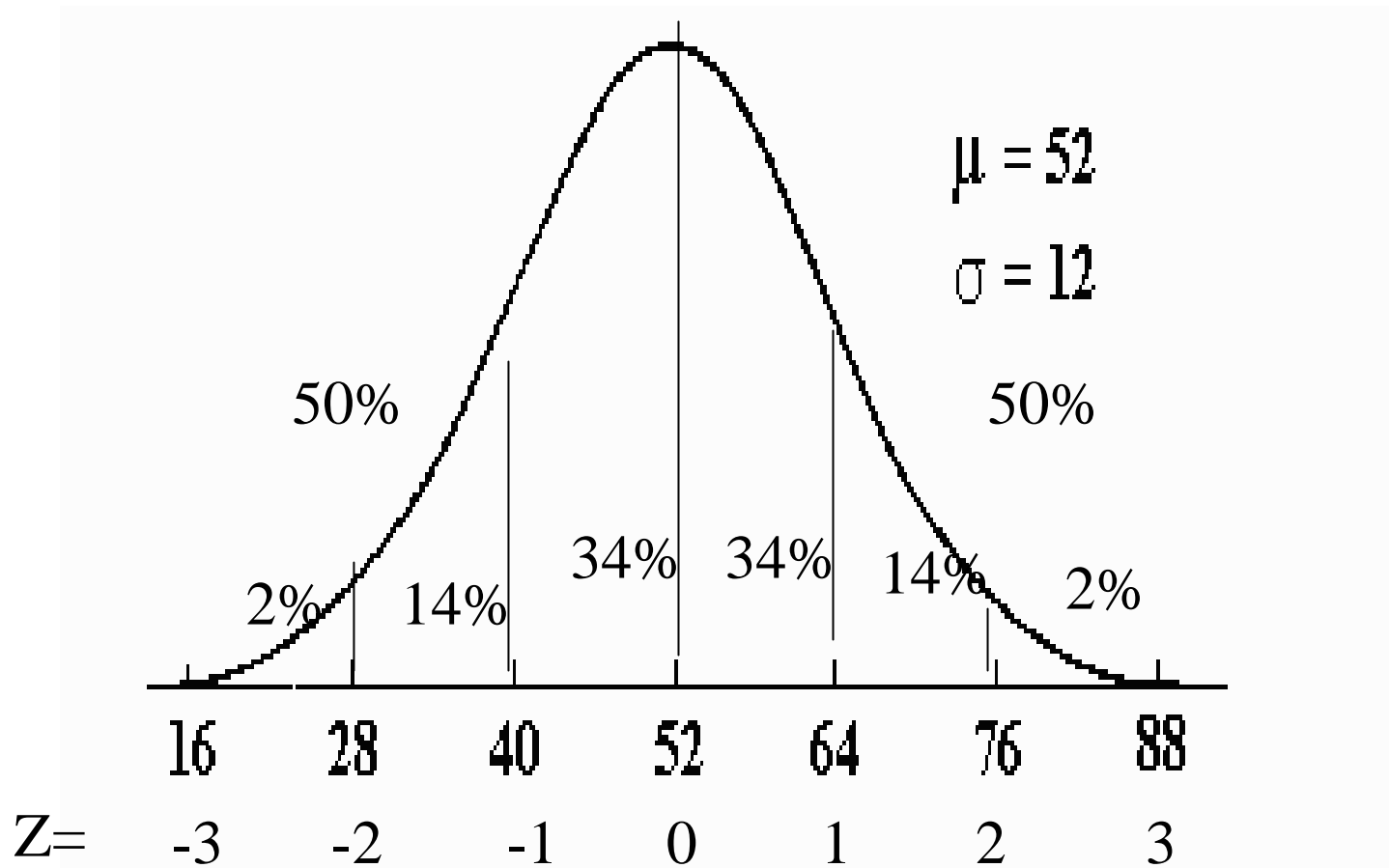
Approximate areas are:

68% within 1 standard deviation plus and minus

95% within 2 standard deviations plus and minus

99.9% within 3 standard deviations plus and minus

Areas under the normal curve



Z-scores and Percentiles in Normal Distribution

Z-score	Percentile
-3	<1
-2	2
-1	16
0	50
1	84
2	98
3	>99

Caution regarding percentiles and Z-scores

- Correspondence only holds in normal distribution.
 - e.g., If non-normal, 1 standard deviation above mean is not 84th percentile.
- Converting skewed distribution of raw scores to Z-scores yields skewed distribution of Z-scores.