

Math 103 Formula Sheet

Financial Management

Simple Interest:

$$I = Prt$$

Future Value for Compound Interest:

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

Annual Yield (effective simple interest rate):

$$Y = \left(1 + \frac{r}{n} \right)^n - 1$$

Monthly Deposit for an Annuity
(A is the amount of the annuity):

$$P = \frac{A \left(\frac{r}{n} \right)}{\left[\left(1 + \frac{r}{n} \right)^{nt} - 1 \right]}$$

Future Value for Simple Interest:

$$A = P(1 + rt)$$

Present Value for Compound Interest:

$$P = \frac{A}{\left(1 + \frac{r}{n} \right)^{nt}}$$

Future Value of an Annuity
(P is the amount of each deposit):

$$A = \frac{P \left[\left(1 + \frac{r}{n} \right)^{nt} - 1 \right]}{\left(\frac{r}{n} \right)}$$

Monthly Mortgage Payments
(P is the amount of mortgage):

$$PMT = \frac{P \left(\frac{r}{n} \right)}{1 - \left(1 + \frac{r}{n} \right)^{-nt}}$$

Probability and Counting Rules

Permutation rule:

$${}_n P_r = \frac{n!}{(n-r)!}$$

Combination rule:

$${}_n C_r = \frac{n!}{(n-r)! r!}$$

$$P(\text{not } E) = 1 - P(E)$$

$$P(A \text{ or } B) = P(A) + P(B)$$

$$P(A \text{ and } B) = P(A) \cdot P(B)$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

Statistics

Mean for the individual data:

$$\bar{X} = \frac{\sum X}{n}$$

Mean for grouped data:

$$\bar{X} = \frac{\sum (f \cdot X)}{n}$$

Standard Deviation:

$$s = \sqrt{\frac{\sum (\text{data item} - \text{mean})^2}{n-1}}$$

Z-score:

$$z = \frac{\text{data item} - \text{mean}}{\text{standard deviation}}$$

Correlation and Regression

Correlation coefficient:

$$r = \frac{n[\sum(xy)] - (\sum x)(\sum y)}{\sqrt{n(\sum x^2) - (\sum x)^2} \cdot \sqrt{n(\sum y^2) - (\sum y)^2}}$$

The regression line equation: $y = mx + b$ where

$$m = \frac{n[\sum(xy)] - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$$

$$b = \frac{(\sum y) - m(\sum x)}{n}$$

z-SCORES AND PERCENTILES							
z-score	Percentile	z-score	Percentile	z-score	Percentile	z-score	Percentile
-4.0	0.003	-1.0	15.87	0.0	50.00	1.1	86.43
-3.5	0.02	-0.95	17.11	0.05	51.99	1.2	88.49
-3.0	0.13	-0.90	18.41	0.10	53.98	1.3	90.32
-2.9	0.19	-0.85	19.77	0.15	55.96	1.4	91.92
-2.8	0.26	-0.80	21.19	0.20	57.93	1.5	93.32
-2.7	0.35	-0.75	22.66	0.25	59.87	1.6	94.52
-2.6	0.47	-0.70	24.20	0.30	61.79	1.7	95.54
-2.5	0.62	-0.65	25.78	0.35	63.68	1.8	96.41
-2.4	0.82	-0.60	27.43	0.40	65.54	1.9	97.13
-2.3	1.07	-0.55	29.12	0.45	67.36	2.0	97.72
-2.2	1.39	-0.50	30.85	0.50	69.15	2.1	98.21
-2.1	1.79	-0.45	32.64	0.55	70.88	2.2	98.61
-2.0	2.28	-0.40	34.46	0.60	72.57	2.3	98.93
-1.9	2.87	-0.35	36.32	0.65	74.22	2.4	99.18
-1.8	3.59	-0.30	38.21	0.70	75.80	2.5	99.38
-1.7	4.46	-0.25	40.13	0.75	77.34	2.6	99.53
-1.6	5.48	-0.20	42.07	0.80	78.81	2.7	99.65
-1.5	6.68	-0.15	44.04	0.85	80.23	2.8	99.74
-1.4	8.08	-0.10	46.02	0.90	81.59	2.9	99.81
-1.3	9.68	-0.05	48.01	0.95	82.89	3.0	99.87
-1.2	11.51	0.0	50.00	1.0	84.13	3.5	99.98
-1.1	13.57					4.0	99.997