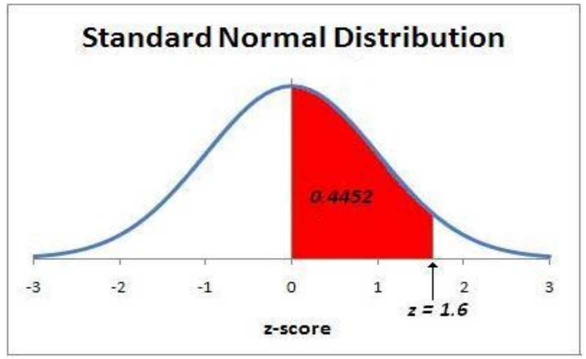
QMB-2100 Formulas and Tables Quick Reference Sheet

Sample mean	$\bar{x} = (\sum x)/n$
Sample st. dev.	$s = \sqrt{\sum (x-\bar{x})^2/(n-1)}$
Binomial probability	$P(x) = \frac{n!}{(n-x)!\,x!} \cdot p^x \cdot q^{n-x}$
Binomial mean	$\mu = n \cdot p$
Binomial Std Deviation	$\sigma = \sqrt{n \cdot p \cdot q}$
***z*-score**	$z = \frac{x-\bar{x}}{s}$ or $\frac{x-\mu}{\sigma}$
C.I. for mean (σ known)	$\bar{x} \pm [z \cdot \sigma/\sqrt{n}]$
C.I. for mean (σ unknown)	$\bar{x} \pm [t \cdot s/\sqrt{n}]$
***n* for margin of error *E* (σ known)**	$n = \left[\frac{z \cdot \sigma}{E}\right]^2$
C.I. for proportion	$\hat{p} \pm \left[z \cdot \sqrt{\hat{p} \cdot (1-\hat{p})/n}\right]$
Regression coefficients	$intercept:\ \bar{y} - b\bar{x}$ $slope:\ b = \frac{\sum xy - n \cdot \bar{x} \cdot \bar{y}}{\sum(x^2) - n \cdot \bar{x}^2}$
C.I. for prediction at x_p	$MLV \pm t \cdot s_E$ $\cdot \sqrt{1 + \frac{1}{n} + \frac{(x_p-\bar{x})^2}{\sum(x-\bar{x})^2}}$
Ho:	*"There is no long-run difference between … "*



Area Under the Curve from 0 to z			
z	**Area**	**z**	**Area**
0.10	0.0398	**1.645***	**0.4500**
0.20	0.0793	1.70	0.4554
0.30	0.1179	1.80	0.4641
0.40	0.1554	1.90	0.4713
0.50	0.1915	**1.960***	**0.4750**
0.60	0.2257	2.00	0.4772
0.70	0.2580	2.10	0.4821
0.80	0.2881	2.20	0.4861
0.90	0.3159	2.30	0.4893
1.00	0.3413	2.40	0.4918
1.10	0.3643	2.50	0.4938
1.20	0.3849	**2.575***	**0.4950**
1.282*	**0.4000**	2.60	0.4953
1.30	0.4032	2.70	0.4965
1.40	0.4192	2.80	0.4974
1.50	0.4332	2.90	0.4981
1.60	0.4452	3.00	0.4987

* Use these *z*-values for confidence intervals, where Area given = ½ the confidence desired.

If we assume something is true (like Ho) and a *really unlikely* event occurs, perhaps our assumption is wrong.

Table of Critical *t*-Values (two tails)				
d.f.	**Desired Level of Confidence**			
(*n*-1)	**80 %**	**90 %**	**95 %**	**99 %**
4	1.533	2.132	2.776	4.604
6	1.440	1.943	2.447	3.143
9	1.383	1.833	2.262	3.250
16	1.337	1.746	2.120	2.921
25	1.316	1.708	2.060	2.787
36	1.306	1.689	2.030	2.722
50	1.299	1.679	2.014	2.678

Use above *t*-values for confidence intervals, where *d.f.* = sample size -1

Table of Critical Fisher Values				
***d.f.* for Denom**	**Degree Conf (%)**	***d.f.* for Numerator**		
		1	**2**	**3**
4	90	4.54	4.32	4.19
	95	7.71	6.94	6.59
	99	21.20	18.00	16.69
6	90	3.78	3.46	3.29
	95	5.99	5.14	4.76
	99	13.74	10.92	9.78
9	90	3.36	3.01	2.81
	95	5.12	4.26	3.86
	99	10.56	8.02	6.99
12	90	3.18	2.81	2.61
	95	4.75	3.89	3.49
	99	9.33	6.93	5.95

Use above for critical value of Variance Ratio = Var(TR) / Var(EF)

Probability
P(*A or B*) = *P*(*A*) + *P*(*B*) if *A*,*B* mutually exclusive
P(*A or B*) = *P*(*A*) + *P*(*B*) – *P*(*A and B*) if *A*,*B* not mutually exclusive
P(*A and B*) = *P*(*A*) · *P*(*B*) if *A*,*B* are independent
P(*A and B*) = *P*(*A*) · *P*(*B*|*A*) if *A*,*B* are dependent