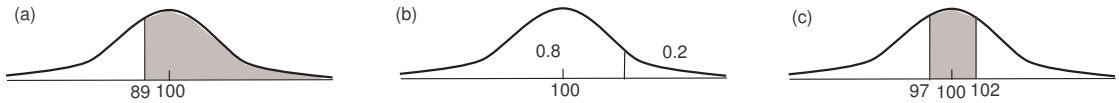
Keys to Version A of Midterm Test 1 in MA 180/418, Spring 2011

Q1: **c** Q2: **a** Q3: **c** Q4: **d** Q5: **b**

Q6: Mean: $\bar{x} = 62.4167$, round off to 62.4
Median: $m = 62.5$
St.Deviation: $s = 17.8145$, round off to 17.8
Variance: $17.8145^2 = 317.3564$, round off to 317.4
Minimal usual value=26.7877, round off to 26.8
Maximal usual value=98.0457, round off to 98.0
27 is a usual value, and 99 is an unusual value
$Q_1 = 46.5$ and $Q_3 = 75.5$. Five numbers: (38,46.5,62.5,75.5,91).

Q7: $z_{\text{SAT}} = -0.23$ and $z_{\text{ACT}} = -0.24$, so the SAT score is relatively better.

Q8: (a) by Table A-2: $z = (89 - 100)/13 = -0.85$, $P = 1 - 0.1977 = 0.8023$
by calculator: **normalcdf(89,999,100,13)**=0.8013
(b) by Table A-2: $z = 0.84$, $x = 100 + 13 \times 0.84 = 110.92$
by calculator: **invNorm(0.8,100,13)**=110.94
(c) by Table A-2: $z = \frac{97-100}{13/\sqrt{35}} = -1.37$ and $z = \frac{102-100}{13/\sqrt{35}} = 0.91$
$P = 0.8186 - 0.0853 = 0.7333$
by calculator: **normalcdf(97,102,100,13/$\sqrt{}$(35))**=0.7325
(d) because the population is normally distributed and because $n > 30$ ($n = 35$)



Q9: (a) 0.05; (b) 0.40; (c) $0.05 \times (4/99) = 0.0020$ (d) $0.05^2 = 0.0025$

Q10: (a) $\mu = 60 \times 0.2 = 12$, $\sigma = \sqrt{60 \times 0.2 \times 0.8} = 3.098$, round off to 3.098
(b) **binomialcdf(60,0.2,9)**=0.2132
(c) **normalcdf(-999,9.5,12,3.098)**=0.2098
(d) binomial: **binomialpdf(60,0.2,10)**=0.1102
normal: **normalcdf(9.5,10.5,12,3.098)**=0.1043