STAT 100 SUMMER II 2001 (PROFESSOR GREEN)
SOLUTIONS TO ASSIGNED PROBLEMS DUE AUGUST 6

Problem 26.

(a) $PX < 18 = P(Z < -.4] = .3446$
(b) $P[X \leq 29] = P[Z \leq 1.8] = .9641$
(c) $P[X > 27] = P[Z > 1.4] = 1 - P[Z < 1.4] = P[Z < -1.4] = .0808$
(d) $P[X > 11] = P[Z > -1.8] = P[Z < 1.8] = .9641$
(e) $P[12 \leq X \leq 31] = P[-1.6 \leq Z \leq 2.2] = P[Z \leq 2.2] - P[Z \leq -1.6] = .9861 - .0548 = .9313$
(f) Same as (e).

Problem 28.

(a) $P[Z < .84] = .7995$; $\quad b = \mu + \sigma z = 14 + 3 \times .84 = 16.52$
(b) $P[Z > 3.1] = .001$; $\quad b = 14 + 3 \times 3.1 = 23.3$
(c) $P[Z < -1.53] = .063$; $\quad b = 14 + 3 \times (-1.53) = 9.41$

Problem 30. Here X is the score of a randomly selected student. X has mean 500 and standard deviation 100.

(a) $P[X > 680] = P[Z > 1.8] = .0359$, or about 3.6% of the applicant pool.
(b) That would have to be the median, which is also the mean, or 500.
(c) $P[Z > 1.04] = 1.5$, so the cutoff score should be $500 + 100 \times 1.04 = 604$.

Problem 34. Let X be the diameter of a random hailstone.

(a) $P[X > .71] = P[Z > 2.1] = .0179$
(b) $P[X > .6] = P[Z > 1] = .1587$. The probability of two such (independent) events occurring successively is $.1587^2 = .0252$.
(c) Same as (a).

Problem 36. Here X is the weight of a random package of cream cheese, with mean 8.3 and standard deviation .1

(a) $P[X < 8] = P[Z < -2] = .0228$
(b) $P[X > w] = .05$. Since

$$P[Z > 1.645] = .05, \quad w = 8.2 + .1 \times 1.645 = 8.3645.$$

Problem 38.

(a) $P[X \leq 26] = P[Z \leq -1.5] = .0668$
(b) $P[X \leq 36] = P[Z \leq 1] = .8413$