

Part 1

- b** 95% of the heights should be within 2 standard deviations of the mean, which is the interval $68 - 5$ to $68 + 5$ or 63 to 73. Thus 5% are outside that interval.
- c** 70.5 is one standard deviation above the mean. Since 68% are within one standard deviation, the remaining 32% are evenly divided into the regions above and below that interval.
- a** The area under any density curve is equal to 1. This curve is skewed left, so it isn't symmetric, Normal, or skewed right.
- c** Since the curve is skewed left, the mean will be "pulled down" by the values in the lower tail, making it less than the median.
- c** Percentile of $z = 1.6$ minus percentile of $z = -0.3$ is $.9452 - .3821 = .5631$.
- e** The distinct curve in the plot indicates that the distribution is strongly skewed (right).
- d** The distribution of z -scores is a linear transformation, so it won't change the shape of the distribution. (See explanation at Quiz 2.1A).
- d** $Q_1 \approx 5.5$ and $Q_3 \approx 6.7$, so IQR is approximately 1.2.
- c** All Normal curves are symmetric and peak at the mean, but 95% of the area is within 2 standard deviations of the mean, not 1.
- c** $z_{30} = \frac{30 - 22}{11.9} = 0.67$, which is the 75th percentile of the Standard Normal curve, so about 25% of the times are above that value.

Part 2

11. (a) In 2009, the z -score for 1% was $\frac{1 - (-0.198)}{2.331} = 0.514$. In 2010, the z -score for 1% was $\frac{1 - (0.078)}{0.821} = 1.123$. This means that 1% had a higher relative standing in 2010 than in 2009. (Percentiles for a 1% increase were 69.6% in 2009 and 86.9% in 2010.)
- (b) $z = \frac{-1 - (-0.198)}{2.331} = -0.34$, percentile for -0.34 is .3669. $61 \text{ days} \times .3669 = 22.38$, or about 22 days. (c) z for 19th percentile (from Table A) is -0.88 . So $-0.88(0.821) + 0.078 = -0.644$ or about a 0.64% decrease. **12.** Mean = $36.5(1.8) + 32 = 97.7$ °F. Standard deviation = $0.3(1.8) = 0.54$ °F. **13.** (a) z for 60th percentile is 0.25, and $0.69 + 0.25(0.16) = 0.73$ ounces.
- (b) $z = \frac{1 - 0.69}{0.16} = 1.94$, which has a proportion of $1 - 0.9738 = .0262$ letters above it requiring additional postage. **14.** The width of this region is 20 seconds, which is one-third the 60-second range of values. Hence the proportion is 0.33. See figure below.

