Quiz 2.2A AP Statistics Name:

1. A study of elite distance runners found a mean body weight of 63.1 kilograms (kg), with a standard deviation of 4.8 kg.

(a) Assuming that the distribution of weights is approximately Normal, make an accurate sketch of the weight distribution with the horizontal axis marked in kilograms.

(b) Use the 68–95–99.7 rule to find the proportion of runners whose body weight is between 48.7 and 67.9 kg.

(c) What proportion of runners have body weights below 60 kg?

(d) What proportion of runners have body weights above 70 kg?

(e) Calculate and interpret the 45th percentile of the runners' body weight distribution.

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2. (a) Find the proportion of observations from a standard Normal distribution that satisfies $-1.51 < z < 0.84$. Sketch the Normal curve and shade the area under the curve that is the answer to the question.

(b) What z-score in a Normal distribution has 33% of all scores above it?

Quiz 2.2A

1. (a) See graph below, left. (b) 48.7 is 3 standard deviations below 63.1, so 99.7/2 or 49.85% or the scores are between 63.1 and 48.7. 67.9 is 1 standard deviation above the mean, so 68/2 or 34% of the scores are between 63.1 and 67.9. Thus 49.85 + 34 = 83.85% of the scores are between 48.7 and 67.9. (c) z-score for 60 is $\frac{60-63.1}{4.8} = -0.65$, which (by Table A) has a percentile of 0.2578, so about 26% of the runners have weights below 60 kg. (d) z-score for 70 is $\frac{70-63.1}{4.8} = 1.44$, which (by Table A) has 1 – .9251 = 0.0749 or about 7.5% of the scores above it. (e) The 45th percentile corresponds to $z = -0.13$. This corresponds to a weight of –0.13(4.8) + 63.1 = 62.476 kg. So about 45% of the runners have weights below 62.5 kg.

2. (a) Proportion = 0.7340. See graph below, right. (b) $z = 0.44$.