In-class/takehome stats exercise

Comment for Question 4
95% of the pebbles have a mass between plus and minus 1.96 standard deviations of the mean. ±1.96 s corresponds to ±94.1 grams. Since you were asked only for an approximation, you could have rounded to ±2 using the values in the table. That would give you ~ ±96 grams. 94.1 grams or 96 grams are acceptable answers.

Comment for Question 7.
You are asked what the probability will be that the mean of another sample collected from the same population of pebbles could be ≥ 357.2 grams. 357.2 grams is 1.5 standard errors away from the sample mean. 1.5 standard errors or 1.5 standard deviations corresponds to the value (area or probability) 0.866 in the table. 0.866 is the probability that the mean will lie between ± 1.5 standard deviations of the mean or between 342.8 and 357.2 grams. 86.6 % of the means of other samples will fall in that range – IF they are from the same parent population. The probability that the mean will be ≥ 357.2 grams but ≤ 342.8 grams would be 1-0.866 or 0.134. The probability that a mean from this parent population could be ≥ 357.2 grams lies in the positive tail of the normal distribution and is one half of the remainder or 0.134/2 = 0.067. Thus there is a 6.7 % chance that a sample with a mean ≥ 357.2 grams could be drawn from the same parent population.

Comment for Question 8
See pages 8-11 of http://www.geo.wvu.edu/~wilson/geomath/lect9/stats3-06.pdf
In Table 7.7 (page 124) the probability that a value will lie between 1.06 and 2.1 standard deviations of the mean is 0.127. The area for 2.1 is read directly from the table as 0.964. The area corresponding to 1.06 standard deviations needs to be estimated by interpolation between the values for 1 and 1.1 standard deviations from the mean. That area is found to be ~0.71. The probability that a pebble will have a mass in the range 1.06 to 2.1 standard deviations from the mean corresponds to ½ the difference in the probabilities associated with 1.06 and 2.1 standard deviations. That probability turns out to be 0.127. We can say that 12.7% of the pebbles will have a mass between +1.06 and 2.1 standard deviations from the mean.