

1) For a normally distributed set of data with mean 74 and standard deviation 8, find the following probabilities.

- a. $P(58 \leq x \leq 74)$ $34 + 13.5 = 47.5\% = 0.475$
 b. $P(66 \leq x \leq 90)$ $68 + 13.5 = 81.5\% = 0.815$
 c. $P(x \geq 90)$ $2.35 + 0.15 = 2.5\% = 0.025$
 d. $P(x \leq 82)$ $68 + 13.5 + 2.5 = 84\% = 0.84$

2) A normal distribution has a mean of 25 and a standard deviation of 5.

Find the percent of values are ...

- a. between 20 and 30 $34\% + 34\% = 68\%$
 b. between 10 and 25 $34 + 13.5 + 2.35 = 49.85\%$ or $50 - 0.15 = 49.85\%$
 c. at least 20 $50 + 34 = 84\%$
 d. at most 30 $50 + 34 = 84\%$
 e. What values make up the middle 95%? $15 - 35$

3) The weights of 1800 fish in a lake are normally distributed with a mean of 3 kg and a standard deviation of 0.6 kg.

- a. About how many of the fish weigh 2.4 kg or more? $68 + 13.5 + 2.5 = 84\% \rightarrow 0.84 \cdot 1800$
 b. About how many of the fish weigh less than 1.8 kg? $2.35 + 0.15 = 2.5\% \rightarrow 0.025 \cdot 1800 \approx 45$ fish
 c. About how many of the fish weigh between 2.4 kg and 4.2 kg? $34\% + 34\% + 13.5\% = 81.5\% \rightarrow 0.815 \cdot 1800 = 1467$ fish
 d. About how many of the fish weigh between 1.8 kg and 4.8 kg? $100\% - 2.5\% - 0.15\% = 97.35\% \rightarrow 0.9735 \cdot 1800 \approx 1752$ fish

4) A forester sampled 27 trees in a wooded area and found that the mean diameter of the trees is 15.4 inches with a standard deviation of 3.7 inches. Suppose that this sample of trees provides an accurate description of the entire forest and that the trees are normally distributed.

- a. What is the range of diameters for the middle 95% of the trees in the forest? $8 - 22.8$
 b. What percent of the trees in the forest should be less than 8 inches in diameter? 2.5%
 c. What is the probability that a selected tree will be between 11.7 and 15.4 inches in diameter? $34\% = 0.34$
 d. There are approximately 1540 trees in the forest. About how many trees are over 19.1 inches in diameter? $13.5 + 2.35 + 0.15 = 0.16$
 $7 \quad 0.16 \cdot 1540 = 246$ trees