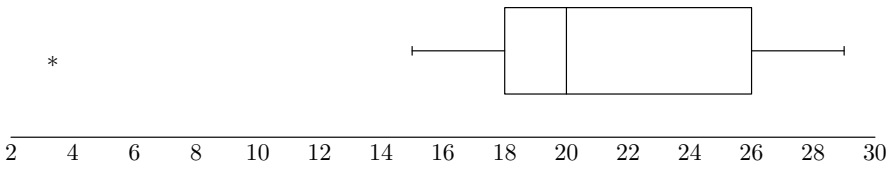
Math 254
Practice Questions for Test 1 (Answers)

1. $\overline{x} = 1.49$ and $s = 0.265$

2. 

3. (a) It contains at least 88.9% of the data.
   (b) It contains at most 25% of the data.

4. (a) $C_3^6 C_3^8 = 1120$
   (b) $C_3^6 \left(C_0^2 C_3^6 + C_1^2 C_2^6\right) = 1000$

5. 65%

6. (a) 0.1, (b) no, (c) 2/3

7. (a) $C_3^{10}(\frac{1}{6})^3(\frac{5}{6})^7 = 0.155$
   (b) $1 - C_0^{10}(\frac{1}{6})^0(\frac{5}{6})^{10} - C_1^{10}(\frac{1}{6})^1(\frac{5}{6})^9 = 0.515$

8. $C_6^{10}(\frac{1}{5})^6(\frac{4}{5})^4 = 0.0055$

9. Rolling at least one six in four throws of one die has a probability $1 - (5/6)^4 = 0.5177$ and rolling at least one double-six in 24 throws of a pair of dice has a probability $1 - (35/36)^{24} = 0.4914$. The more likely one is then rolling at least one six in four throws of one die.

10. $P(\text{spam}|\text{tagged}) = 0.983$

11. (a) $P(W_2) = 5/14$
    (b) $P(W_1|W_2) = 3/5$

12. 0.9745

13. (a) 0.01829. (b) 0.78

14. (a) 0.0988, (b) 0.122.

15. (a) $P(X = 1) = \dfrac{C_1^5 C_5^7}{C_6^{12}} = 0.1136$

    (b) $P(1 \le X \le 3) = \dfrac{C_1^5 C_5^7}{C_6^{12}} + \dfrac{C_2^5 C_4^7}{C_6^{12}} + \dfrac{C_3^5 C_3^7}{C_6^{12}} = 0.871$

16. Site B should be chosen.