

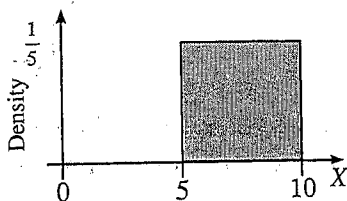
HW 12 — 7.1: 4, 6, 18, 21-24, 33, 36

①

4. We standardize the normal random variables so that one table can be used to find the area under the curve of any normal density function.

6. As σ increases, the height of the graph of the normal density function decreases.

18. (a)



(b) $P(6 \leq X \leq 8) = \frac{1}{5}(8-6) = \frac{2}{5} = 0.4$

(c) $P(5 \leq X \leq 8) = \frac{1}{5}(8-5) = \frac{3}{5} = 0.6$

(d) $P(X \leq 6) = \frac{1}{5}(6-5) = \frac{1}{5} = 0.2$

21. The histogram is skewed to the right, so normal distribution cannot be used as a model for the variable.

22. The histogram is symmetrical and bell-shaped, so a normal distribution can be used as a model for the variable.

23. Graph A matches $\mu = 10$ and $\sigma = 2$, and graph B matches $\mu = 10$ and $\sigma = 3$. We can tell because a higher standard deviation makes the graph shorter and more spread out.

24. Graph A matches $\mu = 8$ and $\sigma = 2$, and graph B matches $\mu = 14$ and $\sigma = 2$. We can tell because a larger mean shifts the graph to the right.

33. (a) Interpretation 1: The proportion of human pregnancies that last more than 280 days is 0.1908. Interpretation 2: The probability is 0.1908 that a randomly selected human pregnancy lasts more than 280 days.

(b) Interpretation 1: The proportion of human pregnancies that last between 230 and 260 days is 0.3416. Interpretation 2: The probability is 0.3416 that a randomly selected human pregnancy lasts between 230 and 260 days.

35. (a) $Z_1 = \frac{X_1 - \mu}{\sigma} = \frac{8 - 10}{3} = -\frac{2}{3} \approx -0.67$

(b) $Z_2 = \frac{X_2 - \mu}{\sigma} = \frac{12 - 10}{3} = \frac{2}{3} \approx 0.67$

(c) The area between Z_1 and Z_2 is also 0.495.