

CHAPTER 4

Section 4-6

- 4-39. a) $P(Z < 1.32) = 0.90658$
 b) $P(Z < 3.0) = 0.99865$
 c) $P(Z > 1.45) = 1 - 0.92647 = 0.07353$
 d) $P(Z > -2.15) = P(Z < 2.15) = 0.98422$
 e) $P(-2.34 < Z < 1.76) = P(Z < 1.76) - P(Z > 2.34) = 0.95116$

4-43. a) $P(X < 13) = P(Z < (13-10)/2)$
 $= P(Z < 1.5)$
 $= 0.93319$

b) $P(X > 9) = 1 - P(X < 9)$
 $= 1 - P(Z < (9-10)/2)$
 $= 1 - P(Z < -0.5)$
 $= 0.69146.$

c) $P(6 < X < 14) = P\left(\frac{6-10}{2} < Z < \frac{14-10}{2}\right)$
 $= P(-2 < Z < 2)$
 $= P(Z < 2) - P(Z < -2)]$
 $= 0.9545.$

d) $P(2 < X < 4) = P\left(\frac{2-10}{2} < Z < \frac{4-10}{2}\right)$
 $= P(-4 < Z < -3)$
 $= P(Z < -3) - P(Z < -4)$
 $= 0.00135$

e) $P(-2 < X < 8) = P(X < 8) - P(X < -2)$
 $= P\left(Z < \frac{8-10}{2}\right) - P\left(Z < \frac{-2-10}{2}\right)$
 $= P(Z < -1) - P(Z < -6)$
 $= 0.15866.$

4-45. a) $P(X < 11) = P\left(Z < \frac{11-5}{4}\right)$
 $= P(Z < 1.5)$
 $= 0.93319$

b) $P(X > 0) = P\left(Z > \frac{0-5}{4}\right)$
 $= P(Z > -1.25)$
 $= 1 - P(Z < -1.25)$
 $= 0.89435$

c) $P(3 < X < 7) = P\left(\frac{3-5}{4} < Z < \frac{7-5}{4}\right)$
 $= P(-0.5 < Z < 0.5)$
 $= P(Z < 0.5) - P(Z < -0.5)$
 $= 0.38292$

$$\begin{aligned}
 \text{d) } P(-2 < X < 9) &= P\left(\frac{-2-5}{4} < Z < \frac{9-5}{4}\right) \\
 &= P(-1.75 < Z < 1) \\
 &= P(Z < 1) - P(Z < -1.75)] \\
 &= 0.80128
 \end{aligned}$$

$$\begin{aligned}
 \text{e) } P(2 < X < 8) &= P\left(\frac{2-5}{4} < Z < \frac{8-5}{4}\right) \\
 &= P(-0.75 < Z < 0.75) \\
 &= P(Z < 0.75) - P(Z < -0.75) \\
 &= 0.54674
 \end{aligned}$$

$$\begin{aligned}
 \text{4-49. a) } P(X > 0.62) &= P\left(Z > \frac{0.62-0.5}{0.05}\right) \\
 &= P(Z > 2.4) \\
 &= 1 - P(Z < 2.4) \\
 &= 0.0082
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } P(0.47 < X < 0.63) &= P\left(\frac{0.47-0.5}{0.05} < Z < \frac{0.63-0.5}{0.05}\right) \\
 &= P(-0.6 < Z < 2.6) \\
 &= P(Z < 2.6) - P(Z < -0.6) \\
 &= 0.99534 - 0.27425 \\
 &= 0.72109
 \end{aligned}$$

$$\text{c) } P(X < x) = P\left(Z < \frac{x-0.5}{0.05}\right) = 0.90.$$

$$\text{Therefore, } \frac{x-0.5}{0.05} = 1.28 \text{ and } x = 0.564.$$

$$\begin{aligned}
 \text{4-57. a) } P(50 < X < 80) &= P\left(\frac{50-100}{20} < Z < \frac{80-100}{20}\right) \\
 &= P(-2.5 < Z < -1) \\
 &= P(Z < -1) - P(Z < -2.5) \\
 &= 0.15245.
 \end{aligned}$$

$$\text{b) } P(X > x) = 0.10. \text{ Therefore, } P\left(Z > \frac{x-100}{20}\right) = 0.10 \text{ and } \frac{x-100}{20} = 1.28.$$

Therefore, $x = 126$. hours