1.

(a)

$$\begin{aligned}\frac{37}{60}\times 42\times 10\times 0.32 &= \$82.88\\ \sqrt{\frac{37}{60}\times 42\times(10\times 0.32\times 0.68+(10\times 0.32)^2)} &= \$17.93\end{aligned}$$

(b)

$$\begin{aligned}\Lambda &= \frac{37}{60}\times 42\times 0.68^{10}\\ 1-e^{-\Lambda} &= 42.16\%\end{aligned}$$

2. _

(a)

$$\begin{aligned}12.3\times 8.5 &= 104.55\\ \sqrt{12.3\times 8.5+12.3^2\times\frac{1}{12}} &= 10.824\end{aligned}$$

(b) By expanding

$$P=\frac{\exp(9\times 12.3(z-1))-\exp(8\times 12.3(1-z))}{12.3(z-1)}$$

and adding coefficients of all powers of z from 0 to 100 we get 0.3605.
Answer: 63.95%.

3. _

(a)

$$G=\begin{cases}0 & t<12\\ \frac{t-12}{23} & 12<t<35\\ 1 & t>35\end{cases}$$

$$\begin{aligned}p &= \frac{1}{30}\left(12+\int_{12}^{30}(1-\frac{t-12}{23})dt\right)=\frac{88}{115}\\ \Lambda &= \frac{9.6}{60}\times(1-p)\times 30=1.127\\ & 1-e^{-\Lambda}\sum_{i=0}^{3}\frac{\Lambda^i}{i!}=2.778\%\end{aligned}$$

(b)

$$\begin{aligned}\Lambda &= \frac{9.6}{60} \times p \times 30 = 3.673 \\ & \frac{\Lambda^2}{2} e^{-\Lambda} = 17.13\%\end{aligned}$$

4. ___

$$W = 8X + 2Y - 5$$

(a)

$$8 \times \frac{1}{13} \times 9 + 2 \times \frac{3}{13} \times 9 - 10 = -¢30.77$$

$$\sqrt{\left(8^2 \times \frac{1}{13} \times \frac{12}{13} \times 9 + 2^2 \times \frac{3}{13} \times \frac{10}{13} \times 9 - 2 \times 8 \times 2 \times \frac{1}{13} \times \frac{3}{13}\right) \frac{52-9}{52-1}} = \$6.276$$

(b)

$$\frac{\binom{4}{2}\binom{12}{5}\binom{36}{2}}{\binom{52}{9}} + \frac{\binom{4}{3}\binom{12}{1}\binom{36}{5}}{\binom{52}{9}} = 0.5732\%$$

5. __

(a) The region is a right-angle triangle with sides of 1 and $\frac{1}{2}$, and the area of $\frac{1}{4}$.

$$\begin{aligned}\Lambda &= \frac{19}{4} \\ 1 - e^{-\Lambda} \sum_{i=0}^{7} \frac{\Lambda^i}{i!} &= 10.86\%\end{aligned}$$

(b)

$$\begin{aligned}\Lambda = 19 \times \pi \times (\frac{1}{4})^2 &= 3.7306 \\ 1 - e^{-\Lambda}(1 + \Lambda) &= 88.66\%\end{aligned}$$