

**D**

# Survival Distribution Function

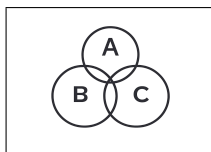
**D**

$$S(x) = P(X > x)$$

$$P(x < 0) = 1$$

$$P(0 \leq x \leq 10) = 1 - \frac{x}{10}$$

$$P(x > 10) = 0$$



$$F(x) = 1 - S(x)$$

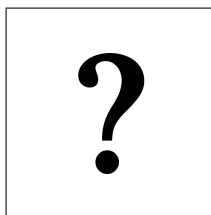
$$F(x < 0) = 0$$

$$F(0 \leq x \leq 10) = x/10$$

$$F(x > 10) = 1$$

$$P(3 < X \leq 7) = F(7) - F(3) = \frac{7}{10} - \frac{3}{10} = \boxed{0.4}$$

$$P(3 < X \leq 7) = S(3) - S(7) = \left(1 - \frac{3}{10}\right) - \left(1 - \frac{7}{10}\right) = \boxed{0.4}$$



$$S(x < 0) = 1$$

$$S(x \geq 0) = e^{-0.34x}$$

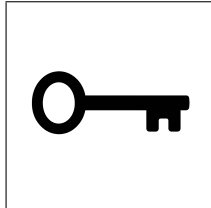
$$a = 10$$

$$b = 23$$

$$P(a < X \leq b) = ?$$

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## Survival Distribution Function

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$$S(x < 0) = 1$$

$$S(x \geq 0) = e^{-0.34x}$$

$$a = 10$$

$$b = 23$$

$$P(a < X \leq b) = ?$$

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$$P(a < X \leq b) = F(b) - F(a)$$

$$P(a < X \leq b) = [1 - S(b)] - [1 - S(a)]$$

$$P(a < X \leq b) = S(a) - S(b)$$

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$$P(10 < X \leq 23) = S(10) - S(23)$$

$$P(10 < X \leq 23) = e^{-0.34(10)} - e^{-0.34(23)}$$

$$P(10 < X \leq 23) = e^{-3.4} - e^{-7.82}$$

$$P(10 < X \leq 23) \approx 0.03337 - 0.00040 = \boxed{0.03297}$$