Solution.

We know that successive attempts are independent. In this case, use the formula for the geometric distribution, because geometric distribution is used for modeling number of failures until the first success.

We know that net cost is the total cost of the experiment minus any financial gain from it.

So after first successful attempt net cost

$$T_1 = K - C$$

After second successful attempt

$$T_2 = K + \frac{K}{3} - C = \frac{4K}{3} - C$$

Similarly,

$$T_3 = K + 2 \cdot \frac{K}{3} - C = \frac{5K}{3} - C$$

$$T_4 = 2K - C$$

$$T_5 = \frac{7K}{3} - C$$

In our problem

$$p = 0.8 \implies q = 1 - p = 0.2$$

Then

$$\mathrm{P}(T = K - C) = 0.2^0 \cdot 0.8 = 0.8$$

$$\mathrm{P}\left(T = \frac{4K}{3} - C\right) = 0.2^1 \cdot 0.8 = 0.16$$

$$\mathrm{P}\left(T = \frac{5K}{3} - C\right) = 0.2^2 \cdot 0.8 = 0.032$$

$$\mathrm{P}(T = 2K - C) = 0.2^3 \cdot 0.8 = 0.0064$$

$$\mathrm{P}\left(T = \frac{7K}{3} - C\right) = 0.2^4 \cdot 0.8 = 0.00128$$

Answer:

$$\mathrm{P}(T = K - C) = 0.8$$

$$\mathrm{P}\left(T = \frac{4K}{3} - C\right) = 0.16$$

$$\mathrm{P}\left(T = \frac{5K}{3} - C\right) = 0.032$$

$$\mathrm{P}(T = 2K - C) = 0.0064$$

$$\mathrm{P}\left(T = \frac{7K}{3} - C\right) = 0.00128$$