A mattress store sells only king, queen and twin-size mattresses. Sales records at the store indicate that one-fourth as many queen-size mattresses are sold as king and twin-size mattresses combined. Records also indicate that three times as many king-size mattresses are sold as twin-size mattresses. Calculate the probability that the next mattress sold is either king or queen-size.

A. 0.12  B. 0.15  C. 0.80  D. 0.85  E. 0.95

Solution.
Let $t$ denote the relative frequency at which twin-sized mattresses are sold, $q$ for queen size frequency, and $k$ for king size frequency. You can actually just think of those frequencies as probabilities. The problem says that $k = 3t$ and that $q = \frac{1}{4}(k + t)$. But since $k = 3t$, we have $q = \frac{1}{4}(3t + t) = t$. Since the sum of all relative frequencies must be 1, we have $t + 3t + t = 1$, and therefore $t = 0.2$. The probability we seek is $k + q = 3t + t = 0.80$. Answer C.

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