14. N · Statistical distributions

Starter Quiz ·

AQA · A-Level · Mathematics Name: _____ Score: _____

1. Which situations can be modelled by a binomial distribution?

   ☐ The number of red cards in 5 cards drawn without replacement

   ☐ The time taken to run 100 m

   ☐ The number of sixes in 12 rolls of a fair dice

   ☐ The number of heads in 20 coin tosses

   Tick every correct option.

2. $X \sim \mathrm{B}(40, 0.25)$. Find $\mathrm{E}(X)$.

   _____

3. $X \sim \mathrm{B}(6, 0.5)$. Find $\mathrm{P}(X = 3)$ as a decimal.

   _____

4. Which expression equals $\mathrm{P}(X \geq 4)$ for a binomial X?

   ☐ $1 - \mathrm{P}(X = 4)$

   ☐ $1 - \mathrm{P}(X \leq 3)$

   ☐ $1 - \mathrm{P}(X \leq 4)$

   ☐ $\mathrm{P}(X \leq 4)$

5. $X \sim \mathrm{N}(50, 4^2)$. Find the z-value for $x = 44$.

   _____

6. Using a normal approximation Y with a continuity correction, $\mathrm{P}(X \geq 30)$ becomes

   ☐ $\mathrm{P}(Y > 30.5)$

   ☐ $\mathrm{P}(Y > 30)$

   ☐ $\mathrm{P}(Y < 29.5)$

   ☐ $\mathrm{P}(Y > 29.5)$

AQA · A-Level · Mathematics

1. **The number of sixes in 12 rolls of a fair dice; The number of heads in 20 coin tosses**

   Without replacement changes p; time is continuous.

2. **10**

   $np = 40 \times 0.25$.

3. **0.3125**

   $\binom{6}{3} \times 0.5^6 = \frac{20}{64}$.

4. $1 - \mathrm{P}(X \leq 3)$

   At least 4 is the complement of at most 3.

5. **-1.5**

   $\frac{44 - 50}{4}$.

6. $\mathrm{P}(Y > 29.5)$

   30 is included, so start from 29.5.