

LEARNING RESOURCE CENTER



Math and Science Resource Center

Normal or Binomial?

Normal Distribution:

- ⇒ It will say "Normally Distributed"
- ⇒ Mean μ is Given
- ⇒ Standard Deviation σ is Given

1st Step: Use the Normal Distribution formula:

$$z = \frac{x - \mu}{\sigma}$$

2nd Step: Find the Probability P from the Z score table

Binomial :

- ⇒ Probability p is Given
- ⇒ Total Number of trials n is Given

CASE 1: (Binomial formula)

If it says **EXACTLY** or if we are considering only a couple of cases:

$$P = {}^n C_x * p^x * q^{n-x}$$

Case 2:

(Normal approximation for Binomial)

Only if $n * p \geq 5$ AND $n * q \geq 5$

If it says less than, more than, at least, at most, fewer or equal to, more than or equal to:

1st Step: find Mean μ & Standard Deviation σ using the formulas:

$$\mu = n \cdot p$$
$$\sigma = \sqrt{n \cdot p \cdot q}$$

2nd Step: Use the formula to find Z

$$z = \frac{x \pm 0.5 - \mu}{\sigma}$$

Use $x+0.5$:

*for Less than or equal to ($\leq$)

*for greater than ($>$)

Use $x - 0.5$:

*for greater than or equal to ($\geq$)

*for Less than ($<$)

3rd Step: Find the Probability P from the Z score table

Recall that $q = 1 - p$

Continuity Corrections when using Normal Approximation to Binomial

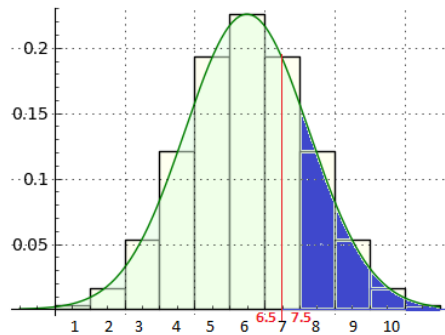
When to add/subtract 0.5 from x:

For $>$ and $<$

Strictly Greater Than or Less Than questions. “Exclusive”

Example:

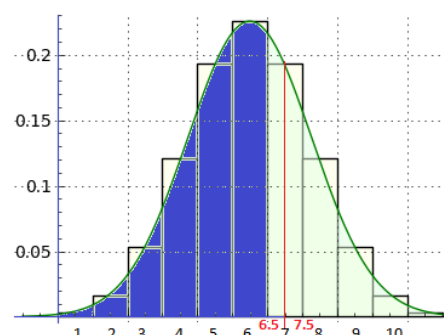
$x > 7$



Need to add (+ 0.5)

Start from 7.5 instead.

$x < 7$



Need to subtract (- 0.5)

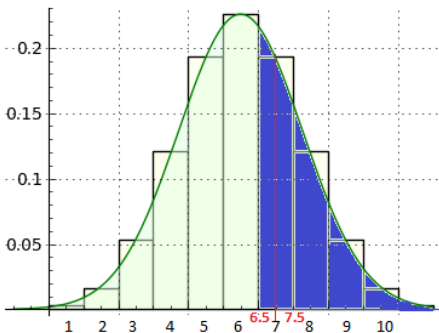
Start from 6.5 instead.

For $\geq$ and $\leq$

Greater Than or Equal to, Less Than or Equal to questions, “At Least”, “At Most”, “Inclusive”

Example:

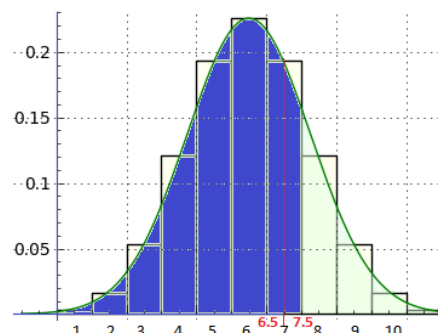
$x \geq 7$



Need to subtract (- 0.5)

Start from 6.5 instead.

$x \leq 7$



Need to add (+ 0.5)

Start from 7.5 instead.

We Only use ± 0.5 for Approximation Problems!!!!!!!!!!!!!!