# Math 32



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# Binomial Distribution

The binomial distribution is a discrete probability distribution where we can compute the probability of observing $k$ successes, each with probability $p$, among $n$ trials with the probability mass function

$$P(X = k) = \binom{n}{k} p^k (1-p)^{n-k}$$

# Cumulative Probability

Press `Run Code` to visualize the distribution, and then add code comments on the lines where there is an octothorpe ( `#` ) to describe what those lines of code do.

Code | Start Over | Run Code

```
kvals <- 0:n
pmf   <- dbinom(kvals, n, p)
tf    <- kvals <= 5 # creates a list of booleans
df    <- data.frame(kvals, pmf, tf) # merge all the values from kvals, pmf, and tf
df %>%
  ggplot(aes(x = kvals, y = pmf, fill = tf)) +
  geom_bar(stat = "identity") +
  labs(title = "Cumulative Probability", # labels the graph
       subtitle = "k is at most 5",
       caption = "Math 32",
       x = "k",
       y = "probability") +
  scale_x_continuous(breaks = 0:n,
                     labels = as.character(0:n))
```

# Math 32

- Parameters
- Probability Mass Function
- Cumulative Probability
- PMF Exercise
- Cumulative Exercise
- Submission

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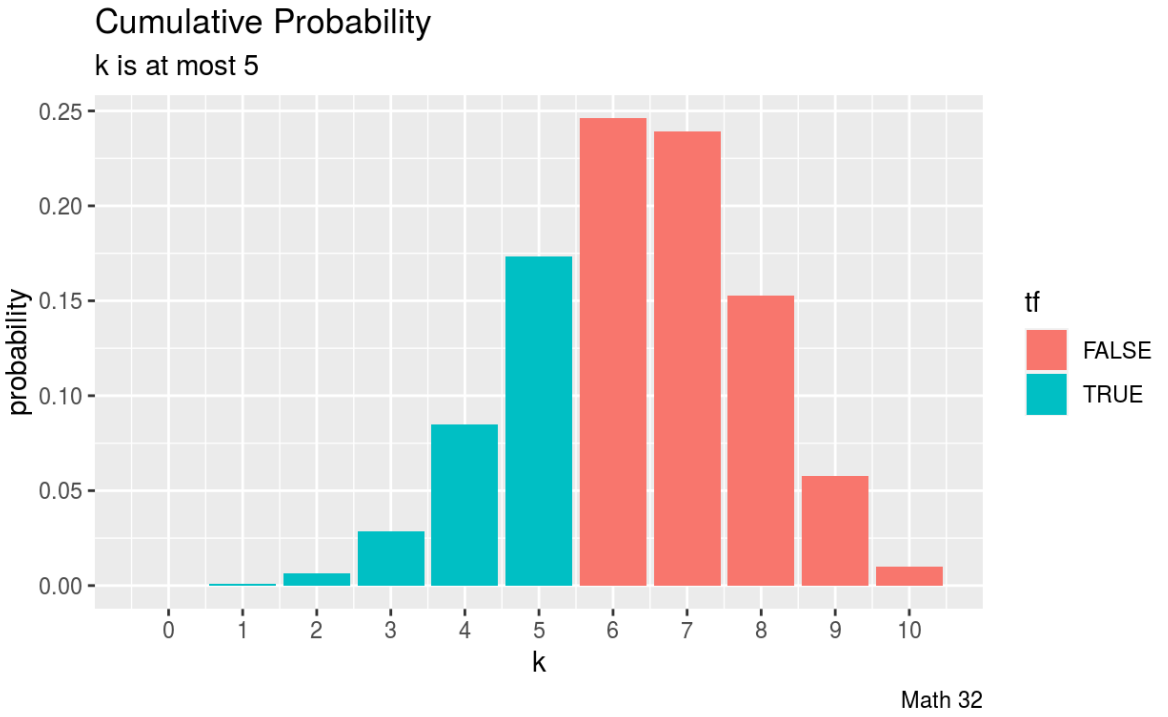


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