

# The binomial distribution

## The binomial distribution

This assessment requires you to use R to describe some properties of the binomial distribution. Each part has equal marks value; attempt them all. Submit via Canvas.

Before you start, execute the following R code which will give you a size and a probability of success. Students who use my ID will receive zero credit.

```
set.seed(1266402) # This is my student ID: replace with yours!  
sample(20:30,1)  # use this for the size
```

```
## [1] 24
```

```
rbeta(1,2,2)      # use this for the probability 'p' of success
```

```
## [1] 0.3974427
```

Above we see that (for me) the size of the distribution is  $n = 24$  and the probability of success is  $p = 0.3974$  (use 4 decimal places). Remember to replace my student ID with yours to get your personal value for size and probability. For the questions below, use the course manual as a guide.

- Plot the probability mass function for your distribution
- Check that the probabilities sum to one
- Use `rbinom()` to generate a random sample from your distribution and give a frequency plot of your observations
- Define your own function [call it `mydbinom()`] that calculates `dbinom()` and compare with R's `dbinom()`. If you can, find a value for `n, r, p` for which `mydbinom(n, r, p)` differs from `dbinom(n, r, p)`.
- For extra credit, sample from the appropriate *Bernoulli* distribution using R, and use this to verify that `dbinom()` is approximately correct.