1 Lesson 10 Example 1

Continuing with the example from the lesson, let Y be the number of Jacks in the community cards. Calculate and graph the p.m.f. of Y

2 Answer

2.1 Calculation of Specific Probabilities

The p.m.f. of Y, the number of Jacks in the community cards, is calculated as follows:

$$P(Y = y) = \frac{\binom{2}{y}\binom{46}{5-y}}{\binom{48}{5}}$$

- **For $Y = 0$:**
$$P(Y = 0) = \frac{\binom{2}{0}\binom{46}{5}}{\binom{48}{5}} = \frac{1 \times 1370754}{1712304} = 1 \times 1 \approx 0.8005$$
- **For $Y = 1$:**
$$P(Y = 1) = \frac{\binom{2}{1}\binom{46}{4}}{\binom{48}{5}} = \frac{2 \times 163185}{1712304} = \frac{326370}{1712304} \approx 0.1906$$
- **For $Y = 2$:**
$$P(Y = 2) = \frac{\binom{2}{2}\binom{46}{3}}{\binom{48}{5}} = \frac{1 \times 15180}{1712304} = \frac{15180}{1712304} \approx 0.0089$$
- $P(Y = 0) \approx 0.8005$
- $P(Y = 1) \approx 0.1906$
- $P(Y = 2) \approx 0.0089$

Graph of the p.m.f.