

CHECK EVEN ANSWERS FROM YESTERDAY:

$$16. \text{ a) } \frac{C(4,3)}{C(12,3)} = \frac{4}{220}$$

$$= \frac{1}{55}$$

$$\approx 0.018 \text{ or } 1.8\%$$

$$\text{b) } \frac{C(8,3)}{C(12,3)} = \frac{56}{220}$$

$$= \frac{14}{55}$$

$$\approx 0.255 \text{ or } 25.5\%$$

$$18. \text{ a) } \frac{3}{16}$$

$$\text{b) } \frac{3}{8}$$

$$\text{c) } \frac{5}{8}$$

Notes 14.3: Binomial Theorem & Probability

A binomial experiment has:

exactly ***two*** outcomes,

a fixed number of trials,

independent outcomes for each trial,

the same probability for each trial.

Notes 14.3: Binomial Theorem & Probability

The diagram illustrates the binomial probability formula: ${}^n C_r ()^r ()^{n-r}$. The components are annotated as follows:

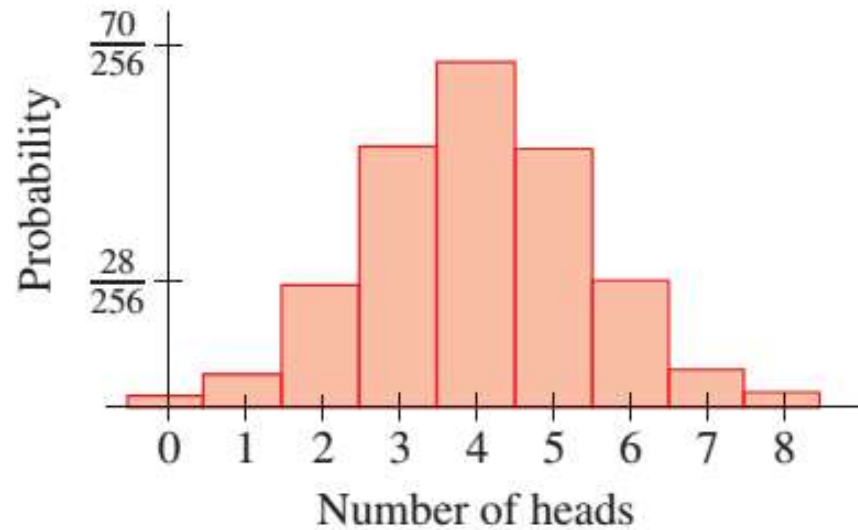
- n** : total # of trials
- r** : # of occurrences for desired outcome
- $()^r$** : probability of given event
- $()^{n-r}$** : probability of complement

The binomial coefficient ${}^n C_r$ is written in blue, while the other terms are in black. Red arrows point from the text labels to the corresponding parts of the formula.

Probability Distribution (table)

Outcome (heads)	Probability
0	$\frac{1}{256}$
1	$\frac{8}{256}$
2	$\frac{28}{256}$
3	$\frac{56}{256}$
4	$\frac{70}{256}$
5	$\frac{56}{256}$
6	$\frac{28}{256}$
7	$\frac{8}{256}$
8	$\frac{1}{256}$

Probability Histogram (graph)



3–14 ■ Binomial Trials Five independent trials of a binomial experiment with probability of success $p = 0.7$ are performed. Find the probability of each event.

3. Exactly two successes

$$P(2 \text{ successes})$$

$$= {}_5C_2 (0.7)^2 (0.3)^3$$

$$= 0.13230 \text{ (or) } 13.23\%$$

5. No successes

7. Exactly one success

9. At least four successes

11. At most one failure

13. At least two successes

14. At most three failures

3-14 ■ Binomial Trials Five independent trials of a binomial experiment with probability of success $p = 0.7$ are performed. Find the probability of each event.

9. At least four successes $= {}_5C_4 (.7)^4 (.3)^1 + {}_5C_5 (.7)^5 (.3)^0$
 $\rightarrow P(4 \text{ successes}) + P(5 \text{ successes})$

Success = 0.52822
 is your focus of this question or 52.822%

11. At most one failure

$P(0 \text{ failures}) + P(1 \text{ failure}) = {}_5C_0 (.3)^0 (.7)^5 + {}_5C_1 (.3)^1 (.7)^4$

failure is the focus

13. At least two successes

14. At most three failures

14.3 #3-13odd, 14-16

14.2 #24-40 even

check odds in book

CHECK EVEN ANSWERS:

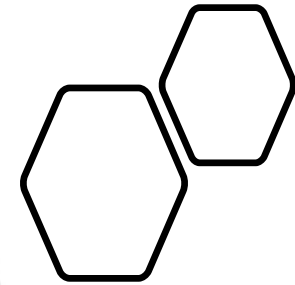
.96922 or 96.922% yes yes
 no no no yes

$$1 \quad \frac{1}{3} \quad \frac{1}{3} \quad \frac{2}{3} \quad \frac{1}{4} \quad \frac{1}{4} \quad \frac{1}{4}$$

$$\frac{4}{11} \quad \frac{4}{11} \quad \frac{5}{11} \quad \frac{5}{11} \quad \frac{1}{13} \quad \frac{4}{13}$$

$$\frac{4}{13} \quad \frac{1}{16} \quad \frac{5}{17} \quad \frac{1}{32} \quad \frac{1}{36} \quad \frac{5}{51}$$

#16 → will be posted on whiteboard



**CHECK YOUR
ANSWERS!**