

1/10 Exercises, #3

$$52 \cdot 10 \cdot 10 \cdot 52 \cdot 52 \cdot 52 \cdot 4 =$$

a) 2924646400

b) $\frac{3120}{2924646400} \leftarrow \leftarrow$

c)

d) $\frac{18720}{2924646400} \leftarrow \leftarrow$

Thm. 1.2

* experiment where all outcomes are equally likely

$$P(A) = \frac{|A|}{|S|}$$

↑
event

Experiment: Flip a coin twice in a row.

$P(\text{HH})$

$$S = \{HH, HT, TH, TT\}$$

$$E = \{HH\}$$

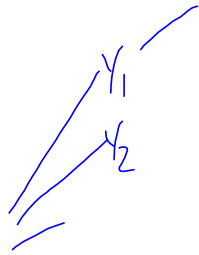
Yogurt container 3 red, 5 yellow,

$P(\text{YY})$

$S = \{YY, YR, RY, RR\}$ Choose 2 w/ replacement

$$E = \{YY\}$$

$$S := \{(y_1, y_1), (y_1, y_2), \dots\} \quad |S| = 64$$



Experiment: Flip a coin 4 times in a row.

$$P(\text{exactly 2 heads}) =$$

$$P(3 \text{ or less tails}) = 1 - P(\text{TTTT})$$
$$= 1 - \frac{1}{16} = \frac{15}{16}$$

HTTH

HHTT

⋮

⋮

28 students $5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 5!$

$$\frac{\underline{28} \cdot \underline{27} \cdot \underline{26}}{25 \cdot 24 \cdot \dots \cdot 2 \cdot 1} = \frac{28 \cdot 27 \cdot \dots \cdot 2 \cdot 1}{25 \cdot 24 \cdot \dots \cdot 2 \cdot 1} = \frac{28!}{25!} = {}_{25}P_3$$

of permutations of 28 things taken 3 at a time.

$${}_n P_r = \frac{n!}{(n-r)!}$$

28 students, give out
3 \$100 prizes.

$${}_{28} C_3 = \frac{28!}{25!3!} = \binom{28}{3}$$

$$|S| = 2 \cdot 2 \cdot 2 \cdot 2 = 16 \quad A = \{$$

$$P(A) = \frac{6}{16}$$

$$|A| = 6$$

HHTT,
HTHT,
HTTH,
THTT,
THTH,
TTHH}