

Starter 1/15

5.1 #31-36

5.2 a

Sample Space (S): A list of all possible outcomes

ex: flip a coin twice: $S = \{HH, HT, TH, TT\}$

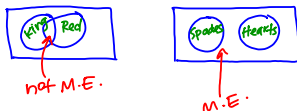
Event: one outcome or a set of outcomes

Probability Rules

- $P(A)$ = Probability that event A will occur = $\frac{\text{\# of outcomes of A}}{\text{total \# of outcomes}}$
- Any probability is a # between 0 & 1.
- the sum of the probabilities is always 1.
- The probability that an event does NOT occur is $1 - P(\text{occurs})$
"not A" = A^c = complement of A
- If 2 events are mutually exclusive (disjoint) then the probability that one or the other occurs is the sum of their probabilities. $P(A \text{ or } B) = P(A) + P(B)$

Mutually exclusive: when the events can't happen at the same time.

OR means ADD, think venn diagrams:



$$P(\text{spade or heart}) = P(\text{spade}) + P(\text{heart})$$

$$\frac{13}{52} + \frac{13}{52}$$

$$\frac{26}{52} = \frac{1}{2}$$

ex: Smartphone market in the U.S.

	Android	Apple	Blackberry	other
P(phone)	53%	26%	7%	?

a) Find the Probability that a customer does not purchase an Android.

$$P(\text{not an Android}) = 1 - P(\text{Android})$$

$$1 - .53 = .47$$

b) Find the probability that a customer purchases an Android or Apple.

$$P(\text{Android or Apple}) =$$

$$P(\text{Android}) + P(\text{Apple})$$

$$.53 + .26 = .79$$

c) Find the probability that a customer purchases one of the 'other' smartphones.

$$1 - P(\text{all the known})$$

$$.53 + .26 + .07 = .86$$

$$1 - 0.86 = 0.14 = P(\text{other})$$

ex: 2010 AP Stats Scores

score	1	2	3	4	5
probability	0.233	0.183	0.235	0.224	0.125

a) show that this is a legitimate probability model.

All probabilities are between 0 and 1
All probabilities add to 1

b) What is the probability that a student passed the AP Exam in 2010?

$$0.235 + 0.224 + 0.125 = 0.584 = 58.4\%$$