

# 4.3 + 4.2 Events and their Probability

49

Event: is a collection of sample points.

Probability of an event: is the sum of the probabilities of the sample points in the event.

Example (Q14 page 154) An experiment has four equally likely outcomes  $E_1, E_2, E_3, E_4$ .

(a) What is the prob. that  $E_2$  occurs?  $\frac{1}{4}$

(b) = = = = any two of the outcomes occur? i.e. ( $E_1$  or  $E_3$ )

$$\frac{1}{4} + \frac{1}{4} = \frac{1}{2}$$

(c) = = = = Three = = = ? ( $E_1$  or  $E_2$  or  $E_3$ )

$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$$

Example (Q21 page 156)

Assume a person is randomly chosen.

(a) what is the prob. the person is 20-24 years old?

$$\frac{19}{281.6} = 0.067$$

Age	Number (million of people)
$\leq 19$	80.5
20-24	19.0
25-34	39.9
35-44	45.2
45-54	37.7
55-64	24.3
$\geq 65$	35.0

281.6 million

(b) what is the prob. the person is 20-34 years old?

$$\frac{19 + 39.9}{281.6} = \frac{58.9}{281.6} = 0.21$$

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(c) what is the prob. the person is 45 years or older?

$$\frac{37.7 + 24.3 + 35}{281.6} = \frac{97}{281.6} = 0.34$$