Solutions

Each answer shows the steps, then the **result**.

2.1

- Two

2.2

- 3 dominant : 1 recessive

2.3

- Genotype is the alleles present; phenotype is the observable trait

2.4

- $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$, by the product rule for independent events

3.1 B

- 3:1

3.2

(a)

- Square gives Tt, Tt, tt, tt

(b)

- Genotype 1 Tt : 1 tt; phenotype 1 tall : 1 short

3.3

- Tt – a short offspring is tt, so it received a t from the tall parent, which must therefore carry a t

3.4

(a)

- Mendel's law of independent assortment

(b)

- $P(pp) = \frac{1}{4}$ and $P(rr) = \frac{1}{4}$
- $P(pp \text{ and } rr) = \frac{1}{4} \times \frac{1}{4} = \mathbf{\frac{1}{16}}$

(c)

- $P(PP \text{ or } pp) = \frac{1}{4} + \frac{1}{4} = \mathbf{\frac{1}{2}}$

(d)

- **9 : 3 : 3 : 1** purple round : purple wrinkled : white round : white wrinkled

3.5 A

- two haploid gametes fuse, restoring diploidy and combining alleles from two parents