

Solutions

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

2.1

- Crossing over

2.2

- Homologous pairs line up randomly, so chromosomes sort into gametes in many combinations

2.3

- $2^3 = 8$ combinations

3.1 B

- exchanging segments between homologous chromosomes

3.2

(a)

- Crossing over, independent assortment, random fertilization

(b)

- Each homologous pair aligns independently, so the maternal and paternal chromosomes are mixed into gametes in many different combinations

3.3

- Sexual reproduction combines crossing over, independent assortment, and random fertilization to mix alleles from two parents, whereas asexual reproduction copies one parent's genome, giving little variation