Solutions

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

2.1

- Mitochondria

2.2

- It modifies, sorts, and ships proteins

2.3

- Ribosomes

2.4

- ribosomal RNA (rRNA) and protein
- every form of life, prokaryote and eukaryote, has them and uses them to make proteins, so they are likely inherited from a common ancestor

3.1 B

- the rough ER

3.2

(a)

- Ribosome/rough ER
- vesicle
- Golgi
- vesicle
- cell membrane

(b)

- It modifies, sorts, and packages the protein for export

3.3

- Muscle cells need a lot of ATP for contraction, and mitochondria carry out respiration to make ATP, so many are present

3.4

(a)

- R is the large central vacuole
- it stores water and nutrients and pushes the cytoplasm against the cell wall; this turgor pressure keeps the cells firm, so the plant stays upright

(b)

- P is a mitochondrion
- the folds (cristae) give a large surface area for the electron transport chain and ATP synthase, so more ATP is made; the membranes also separate compartments for different stages of aerobic respiration

(c)

- S is the Golgi complex
- it modifies proteins, for example by glycosylation (adding carbohydrate groups), which affects their function or sends them to the right place, then packages them in vesicles

3.5 B

- lysosomes digest unwanted material and worn-out organelles and take part in apoptosis; A is ribosomes on the rough ER, C the vacuole, D the chloroplast