

Solutions

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

2.1

- upper chambers: **atria**
- lower chambers: **ventricles**

2.2

- the septum keeps oxygenated and deoxygenated blood **apart**

2.3

- oxygenated blood to the heart: the **pulmonary vein**

2.4

- the left ventricle pumps blood **all round the body**, against greater resistance
- it needs a **thicker wall** to produce the higher pressure

2.5

- vein valves **prevent backflow**, keeping blood towards the heart

3.1 B

- the left ventricle pumps blood to the **whole body**, so its wall is thickest
- A is the right ventricle; C and D are false

3.2

(a)

- muscles need more **oxygen and glucose** during exercise
- a faster heart rate **delivers blood faster**

(b)

- any **two** of: high-fat diet / lack of exercise / smoking / stress / genetics or age

3.3

(a)

- **pulmonary artery**; the blood in it is **deoxygenated**

(b)

- vena cava → right atrium → right ventricle → pulmonary artery
- lungs → pulmonary vein → left atrium → left ventricle → aorta

(c)

- blood passes through the heart **twice** per circuit
- once to the lungs and once to the body

- advantage: blood is **re-pressurised** so it reaches every organ quickly

(d)

- wall: artery **thick, muscular, elastic**; vein **thin**
- lumen: artery **narrow**; vein **wide**
- valves: artery **none**; vein **yes**

(e)

- wall **one cell thick** → short diffusion distance
- **narrow lumen** slows the blood, giving more time for exchange