

Solutions

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

2.1

- Enough energy (at least E_a); correct orientation

2.2

- The minimum energy needed for a collision to lead to reaction

2.3

- Particles have more kinetic energy, so more of them exceed E_a

3.1 B

- the minimum energy for a collision to react

3.2

(a)

- Not enough energy (below E_a); wrong orientation

(b)

- Heating raises particle energy, so more collisions exceed E_a and collisions are more frequent, increasing the rate

3.3

- It represents the fraction of molecules with energy $\geq E_a$ (able to react); heating shifts the curve right so this area grows