Solutions

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

2.1

- aluminium oxide (alumina) / silica on a plate

2.2

- $R_f = 3.6/4.8 = 0.75$

2.3

- ink would dissolve in the solvent and separate, giving extra spots; pencil does not move

2.4

- so the spots do not dissolve into the solvent in the tank

3.1 C

- R_f is always between 0 and 1, so 1.4 is impossible

3.2 B

- A smaller R_f means it sticks more strongly to the stationary phase and moves less

3.3

(a)

- $R_f = \dfrac{2.1}{6.0} = 0.35$

(b)

- it binds (adsorbs) strongly to the stationary phase

3.4

- the components have different affinities for the stationary and mobile phases; so they travel up the plate at different rates and end at different heights, giving different R_f values

3.5

- spray with a locating agent such as ninhydrin and warm, giving coloured spots
- or shine ultraviolet light on a plate containing a fluorescent indicator, and mark the dark spots

3.6

(a)

- the food dye contains dye E (and one other dye)

(b)

- R_f values depend on the conditions, such as the solvent, the temperature and the plate
- on the same plate the conditions are identical, so the spots can be compared directly