1a) 1.2567
2.346
−3.9876
+ 8.34
7.9551
7.96

1b) $\frac{25.346 \cdot 2.3567}{3.561} = 16.77419\ldots$
(5) (5) (4)
1 2 3 4
16.77

1c) 44.89
45.7
90.59
(3) (2)
$90.59 \cdot 4.56 = 413.0904$
1 2 3
413

1d) (2.59 · 4.356) + (7.865 · 3.24)
(3) (4) (4) (3)
11.28204
25.4826
11.28204
+ 25.4826
36.76464
36.8

1e) $1.234 \cdot 10^{-3} + 3.45 \cdot 10^{-2}$
$34.5 \cdot 10^{-3}$
$+ \quad 1.234 \cdot 10^{-3}$
$35.734 \cdot 10^{-3}$
$35.7 \cdot 10^{-3}$
$3.57 \cdot 10^{-2}$

2a) pure substance

2b) heterogenous mixture (oil and water do not mix well)

2c) homogenous mixture (cooking oil is a mix of different hydrocarbons)

3a) chemical, usually a precipitation reaction

3b) physical, we can seperate with physical methods

3c) chemical, make gas releases heat

3d) physical, simple seperation based on boiling point

4) Compound B has a higher boiling point. In distilation the substance with the lower boiling point vaporizes first and is then recondensed and collected. We can see substance A as a gas in the flask being heated and as a liquid in the collection flask at the end of the condenser. This shows that substance A has the lower boiling point and that substance B has a higher boiling point.

5) A) $25.47\,cm \times 25.39\,cm = 646.6833\,cm^2$

$646.7\,cm^2$

B) 26.70
25.67
1.03 $\quad 1.03\,mL$

C) $1.03\,mL = 1.03\,cm^3$

$$\frac{1.03\,cm^3}{646.6833\,cm^2} = 0.001592\,cm$$

(3) (4)

$0.00159\,cm$

$1.59 \times 10^{-3}\,cm$

6) To calculate the density the student needs to know the mass of the aluminum. To find the density the student needs to take the mass and divide it by the volume.

$D = \frac{m}{V}$

7) Dye 4 shows 3 distinct components as 3 spots on the chromatogram.

The dye that moves the most will have the greatest attraction to the solvent. In this example dye 3 has moved the most so has the greatest affinity for the solvent.

The dye that moves the least has the lowest attraction for the solvent. In this case that is dye 1.