Analytic Geometry – Answers

Problem 1

(a) $\begin{bmatrix} 7 \\ 3 \end{bmatrix}$.

(b) $\sqrt{58}$.

(c) $\frac{\pi}{4}$

Problem 2

$$\begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 5 \\ 2 \\ 0 \end{bmatrix} + t \begin{bmatrix} 2 \\ 3 \\ 1 \end{bmatrix}$$

Problem 3 There is one vector that point on both lines:

$$\begin{bmatrix} 2 \\ 3 \\ -1 \end{bmatrix}$$

The lines are not parallel. They do intersect.

Problem 4 The longest distance is 70 cm.

Problem 5 The shortest distance is $2\sqrt{11}$.

Problem 6 The shortest distance is $\sqrt{3}$.

Problem 7 The objects will travel at velocity

$$\begin{bmatrix} 7/5 \\ 1 \\ 8/5 \end{bmatrix} \quad \text{(in m/s)}.$$

after the collision.