Exam I Answers
Math 126 F Autumn 2018

1. (a) (4 points) $\theta = \cos^{-1}\left(\dfrac{7}{\sqrt{6}\sqrt{14}}\right)$

   (b) (3 points) $\left(2, \dfrac{19}{5}, \dfrac{12}{5}\right)$

   (c) (3 points) $x = 2 - 5t, y = \dfrac{19}{5} - 3t, z = \dfrac{12}{5} + t$

2. (4 points) Any plane of the form $2x - 3y - z = d$, where $d \neq 0$ is correct.

3. (2 points each) (a) $\left(\dfrac{-7\sqrt{3}}{2}, \dfrac{7}{2}\right)$; (b) $\left(-7, -\dfrac{\pi}{6}\right)$; (c) $\left(-7, \dfrac{11\pi}{6}\right)$

4. (a) (4 points) i. parabola; ii. hyperbola; iii. pair of lines; iv. parabola.

   (b) (1 point) hyperbolic parabola

   (c) (5 points) $(5, -1, \sqrt{13})$, $(15, -9, 3\sqrt{13})$

5. (a) (3 points) $\mathbf{v}(t) = \langle t^2, 0 \cos t \rangle$

   (b) (3 points) $a_T = \dfrac{2t^3 - \sin t \cos t}{\sqrt{t^4 + \cos^2 t}}$

   (c) (4 points) $\mathbf{r}\left(\dfrac{\pi}{2}\right) = \left\langle \dfrac{\pi^3}{24} + 1, 2, 301 \right\rangle$

6. (a) (4 points) $\left(0, -\dfrac{5}{3}, -1\right)$ and $\left(0, \dfrac{5}{3}, -1\right)$

   (b) (6 points) Yes! They intersect at $\left(\dfrac{-10}{3}, 0, \dfrac{-13}{3}\right)$