

Math 126 Autumn 2014
Final Exam Answers

1. (a) $\mathbf{a} \cdot \mathbf{b} = \pm 3$ or NOT ENOUGH INFO
(b) $|\mathbf{a} \cdot \mathbf{b}| = 3$
(c) $\frac{\pi}{3}$
(d) $|\text{comp}_{\mathbf{a}} \mathbf{b}| = 1$
(e) $x + 5y + z = 0$
2. (a) D; (b) A; (c) F; (d) B.
3. $x = 4 - 2t, y = -2 - 2t, z = 1 + \frac{3}{2}t$
4. $a = 10$
5. The maximum value of $F(x, y)$ on D is 66. The minimum is 0.
6. (a) $3 \ln(9) - \frac{8}{3}$
(b) $9 - 4\sqrt{2} + \frac{\pi}{2}$
7. (a) $T_2(x) = 4 + 2(x - 1) - \frac{1}{2}(x - 1)^2$
(b) Using the fact that $|f'''(x)| \leq 48$ on the interval $[\frac{1}{4}, \frac{7}{4}]$, one possible answer is that $|f(x) - T_2(x)| \leq \frac{27}{8}$.
8. (a) $\sum_{k=0}^{\infty} \left(-\frac{1}{e^{2k+2}} + \frac{(-1)^k(\pi - 1)^{2k+1}}{(2k + 1)!} \right) x^{2k+2}$
(b) $f^{(674)}(0) = 674! \left(-\frac{1}{e^{674}} + \frac{(\pi - 1)^{673}}{673!} \right)$