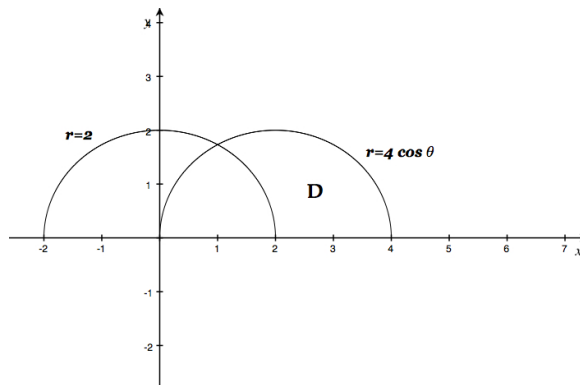


MATH 126 – Winter 2009
Final Exam Answers

- (a) $x + y = 2$
(b) $\left(\frac{3}{2}, \frac{1}{2}, -5\right)$
- (2, 2) and (-2, 2)
- The minimum speed is 3 feet per second.
- (a) $T_2(x) = 1 + 2(x - 1) + \frac{3}{2}(x - 1)^2$
(b) $F(0.8) \approx 0.66$
(c) One acceptable answer is $|F(x) - T_2(x)| \leq \frac{4}{6}|0.2|^3$. (A larger bound might be acceptable with the appropriate work.)
- (a) The Taylor series for $f(x)$ based at $b = 0$ is:

$$1 + \sum_{k=0}^{\infty} \frac{(-1)^k 3^{k+1}}{e^{k+1}(k+1)} x^{k+1}.$$

- (b) The series converges for $|x| < \frac{e}{3}$.
- (a) $x = -t$, $y = 1$, $z = \pi + 2t$
(b) $y = 1$
- (a) The domain is all points on and inside the circle centered at (e, e) with radius $5e$ that lie *above* the line $y = x$.
(b) $-\frac{4}{3}(x - e) + \left(\frac{4}{3} - \frac{3 \ln 3e}{4}\right)(y - 4e) - (z - 4e \ln 3e) = 0$
- (a) Here's what D looks like:



- (b) $\frac{2\pi}{3} + \sqrt{3}$
- There is a saddle point at $(0, 0)$ and a local minimum at $\left(\frac{9}{2}, 3\right)$.