

MTH 236 Calculus IV Partial Answer Key Practice Questions Answers for First Exam Semester 082 (12.1 – 12.5, 13.1, 13.2)

1. Defined for $t \leq 1$ and $t \neq 0$.

2. $\mathbf{i} + \frac{3}{2}\mathbf{j} + 2\mathbf{k}$

3. $x = 3(y-1)^2$

4. $\mathbf{r}(t) = \frac{t^3}{3}\mathbf{i} + (\frac{t^2}{2} - 1)\mathbf{j} + (\frac{e^{2t}}{2} + \frac{1}{2})\mathbf{k}$

5. Smooth for $t \neq 0$ or 2π .

6.

a) Approx 2.118 sec.

b) Approx 117.4 ft.

c) Approx 58.78 ft / sec.

7.

a) $\langle -2\sin(t), -2\cos(t), 1 \rangle$

b) $\sqrt{5}$

c) $\langle -2\cos(t), 2\sin(t), 0 \rangle$

d) $\langle \frac{-2}{\sqrt{5}}, 0, \frac{1}{\sqrt{5}} \rangle$

e) $\langle 0, 1, 0 \rangle$

f) $2/5$

g) 0

h) 2

i) $\mathbf{a} = 0\mathbf{T} + 2\mathbf{N}$

10. $3 + \ln(2)$

13. a) 2 b) $\frac{1}{2}$