

Practice Quiz 2 V_P_Sp01_11.1-11.5,12.1,12.3,12.5-12.8_PQ20010217 (update/print February 16, 2001 6:26 PM)

Do this practice quiz and turn it in with your homework for extra credit.

Name: _____

Directions below are for the actual quiz...

Be honest. Follow the Quiz/Test Policy. Please identify your answers by circling them where feasible, etc. No reference material allowed on this quiz unless otherwise stated. Show ALL WORK or no credit. It is O.K. to use Calculators (but no TI-89's or other symbolic calculators are allowed unless otherwise stated).



Note: Exact answers are required where possible unless otherwise stated.

Note: Manufacturer software bug.

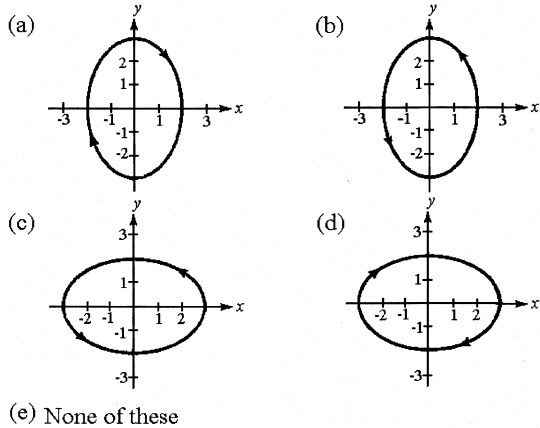
On the e^t , a box appears on occasion. Replace it with a negative to get e^{-t} .

Pages 1, 2, 3, 4 of 6 plus solutions.

Practice Quiz 2 - Calculus 3 - Ch 11.1 - 11.5, 12.1, 12.3, 12.5 - 12.8
Multiple Choice

1. Find the domain of the vector-valued function $r(t) = 3ti - \sqrt{1-t^2}j + 4k$.
- (a) $(-\infty, \infty)$
 - (b) $(-\infty, -1] \cup [1, \infty)$
 - (c) $-1 \leq t \leq 1$
 - (d) $-1 < t < 1$
 - (e) None of these

2. Sketch the curve represented by the vector-valued function $r(t) = 3 \cos(2t)i - 2 \sin(2t)j$ and indicate the orientation of the curve.



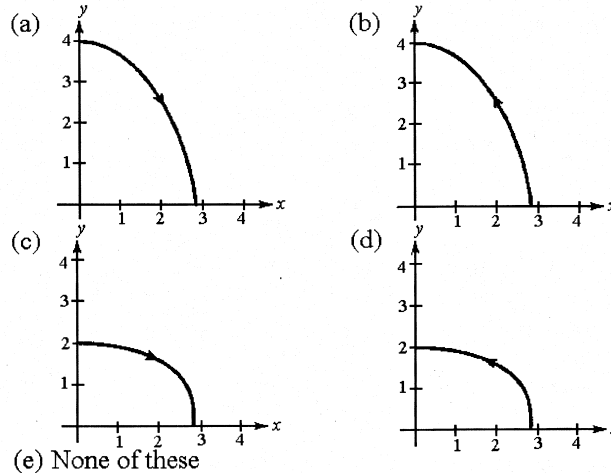
3. Represent the ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ by a vector-valued function.
- (a) $5 \cos ti + 4 \sin tj, 0 \leq t \leq 2\pi$
 - (b) $5 \sin ti + 4 \cos tj, 0 \leq t \leq \pi$
 - (c) $4 \cos ti + 5 \sin tj, 0 \leq t \leq 2\pi$
 - (d) $\cos\left[\frac{t}{5}\right]i + \sin\left[\frac{t}{4}\right]j, 0 \leq t \leq 4\pi$
 - (e) None of these

4. Represent the parabola $x = y^2 - 1$ by a vector-valued function.
- (a) $ti + (t^2 - 1)j$
 - (b) $ti + (t^2 + 1)j$
 - (c) $t^2i + (t - 1)j$
 - (d) $(t^2 + 1)i + tj$
 - (e) None of these

5. Evaluate the limit: $\lim_{t \rightarrow 0} \left[ti + \frac{\sin t}{t}j + \frac{1}{e^{0t}}k \right]$.
- (a) $j + k$
 - (b) k
 - (c) j
 - (d) Undefined
 - (e) None of these

6. Find the domain of the vector-valued function $r(t) = \frac{1}{t}i + \ln(-t)j + t^2k$.
- (a) $(0, \infty)$
 - (b) $(-\infty, 0)$
 - (c) $(-\infty, 0) \cup (0, \infty)$
 - (d) $(-\infty, -1)$
 - (e) None of these

7. Use a graphing utility to graph the vector-valued function $r(t) = \sqrt{8-t^3}i + t^2j$ and give the orientation of the curve.



8. Find $r(t)$ if $r'(t) = \frac{1}{1+t^2}i + e^{0t}k$ and $r(0) = i - k$.
- (a) $\arctan ti - e^{0t}k$
 - (b) $(\arctan t + 1)i - e^{0t}k$
 - (c) $\arctan ti + e^{0t}k$
 - (d) $(\arctan t + 1)i + e^{0t}k$
 - (e) None of these

9. Evaluate: $\int_0^{\pi} (\sin ti + t^2j + k) dt$.
- (a) $-2i + \frac{\pi^3}{3}j + k$
 (b) $i + \frac{\pi^3}{3}j + \pi k$
 (c) $\frac{\pi^3}{3}j + \pi k$
 (d) $\pi^2j + \pi k$
 (e) None of these

10. Evaluate: $\int_0^1 \left[e^{t^2}i + \frac{1}{t+1}j \right] dt$.
- (a) $-\frac{1}{e}i + \ln 2j$
 (b) $\left[1 - \frac{1}{e} \right]i + \ln 2j$
 (c) $(1 - e)i + \ln 1j$
 (d) $\frac{1}{e}i + \ln 2j$
 (e) None of these

11. Find the velocity vector for an object having $a(t) = e^tj - 32k$, if $v(0) = 3i - 2j + k$.
- (a) $e^tj - 32k + C$
 (b) $3i + (e^t - 2)j + (-32t + 1)k$
 (c) $3i + \left[\frac{e^t + 1}{t + 1} - 3 \right]j + (-32t + 1)k$
 (d) $3i + (e^t - 3)j + (-32t + 1)k$
 (e) None of these

12. Let $T(t) = \frac{1}{\sqrt{9t^2 + 5}}(3ti + j - 2k)$. Find $\frac{dT}{dt}$.
- (a) $\frac{1}{\sqrt{9t^2 + 5}}(3i)$
 (b) $\frac{-2t}{(9t^2 + 5)^{3/2}}(3i)$
 (c) $\frac{3}{(9t^2 + 5)^{3/2}}(5i - 3tj + 6tk)$
 (d) $\frac{-2t}{(9t^2 + 5)^{3/2}}(3ti + j - 2k)$
 (e) None of these

13. Let $T(t) = \frac{1}{\sqrt{10 + 4t^2}}(3i - j + 2tk)$. Find $\frac{dT}{dt}$.
- (a) $\frac{1}{\sqrt{10 + 4t^2}}(2k)$
 (b) $\frac{4}{(10 + 4t^2)^{3/2}}(-3ti + tj + 5k)$
 (c) $\frac{-4t}{(10 + 4t^2)^{3/2}}(2k)$
 (d) $\frac{-4t}{(10 + 4t^2)^{3/2}}(-3ti + tj + 5k)$
 (e) None of these

14. Find the unit tangent vector to the curve given by $r(t) = \sqrt{t}i + tj$ when $t = 4$.
- (a) $\frac{1}{4}i + j$
 (b) $\frac{1}{\sqrt{5}}(2i + j)$
 (c) $\frac{1}{\sqrt{17}}(i + 4j)$
 (d) $\frac{1}{\sqrt{5}}(i + 2j)$
 (e) None of these

15. Find the curvature at $t = 1$ of the curve given by $r(t) = t^2i + tj + k$.
- (a) $\frac{2}{5^{3/2}}$
 (b) 2
 (c) $\frac{2}{5^{1/2}}$
 (d) $\frac{1}{5^{3/2}}$
 (e) None of these

16. Find the curvature of the plane curve $y = \frac{1}{x}$ at the point $(-1, -1)$.
- (a) $\frac{1}{2^{3/2}}$
 (b) $-\frac{\sqrt{2}}{2}$
 (c) $\frac{2}{3^{3/2}}$
 (d) $\frac{1}{\sqrt{2}}$
 (e) None of these

17. Find the curvature of the plane curve given by $r(t) = 3 \cos ti + 3 \sin tj$ at the point $(\sqrt{2}, \sqrt{7})$.
- (a) $\frac{1}{9}$
 (b) 3
 (c) $\frac{1}{2\sqrt{3}}$
 (d) $\frac{1}{3}$
 (e) None of these

18. Find the domain of the function $f(x, y) = \sqrt{16 - 4x^2 - y^2}$.
- (a) $\frac{x^2}{4} + \frac{y^2}{16} \geq 1$
 (b) $\frac{x^2}{4} + \frac{y^2}{16} \leq 1$
 (c) $4x^2 + y^2 \neq 0$
 (d) $\frac{x^2}{2} + \frac{y^2}{4} \leq 16$
 (e) None of these