

Partial solutions for 9-12 23 24 36 37 42

9.  $r'(t) = \langle \frac{1}{2\sqrt{t-2}}, 0, -\frac{2}{t^3} \rangle$

10.  $r'(t) = \langle -e^{-t}, 1 - 3t^2, 1/t \rangle$

11.  $r'(t) = 2t\mathbf{i} - 2t \sin(t^2)\mathbf{j} + 2 \sin(t) \cos(t)\mathbf{k}$

12.  $r'(t) = -\frac{1}{(1+t)^2}\mathbf{i} + \frac{1}{(1+t)^2}\mathbf{j} + \frac{t^2+2t}{(1+t)^2}\mathbf{k}$

23.  $t = 1$ .  $r'(1) = \langle 2, 2, 1 \rangle$ . Tangent line:  $x = 2 + 2t$ ,  $y = 4 + 2t$ ,  $z = 1 + t$

24.  $t = 0$ .  $r'(0) = \langle 1, 1, \ln 2 \rangle$ . Tangent line:  $x = t$ ,  $y = t$ ,  $z = 1 + (\ln 2)t$

36.  $\frac{124}{5}\mathbf{i} + \frac{256}{15}\mathbf{k}$

37.  $\ln 2\mathbf{i} + \frac{\pi}{4}\mathbf{j} + \frac{1}{2}\ln 2\mathbf{k}$

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