

13.1

5. $l = (3, -5, 7) + t * (3, 0, 1) = (3 * t + 3)i - 5j + (7 + t)k$

17. Center is origin, (0,0). Radius is 9 and this circle is in the xy -plane.

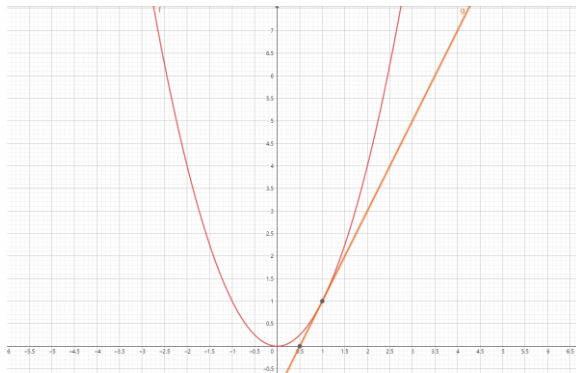
13.2

3. $\lim_{t \rightarrow 0} e^{2t}i + \ln(t + 1)j + 4k = i + 0 * j + 4k$

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

7. $r'(t) = (1, 2t, 3t^2)$

15. r_1



r_2 has the same graph as r_1 's.

31. $r'(t) = \langle -2t, 5, 6t^2 \rangle \quad r'(2) = \langle -4, 5, 24 \rangle$

$r(2) = \langle -3, 10, 16 \rangle$

the tangent line $l = \langle -3 - 4t, 10 + 5t, 16 + 24t \rangle = (-3 - 4t)i + (10 + 5t)j + (16 + 24t)k$

33. $r'(s) = -4s^{-2}i + 8s^{-4}j \quad r'(2) = -i + \frac{1}{2}j$

$r(2) = 2i - \frac{1}{3}j$

the tangent line $l = (2 - t)i + \left(\frac{t}{2} - \frac{1}{3}\right)j = \langle 2 - t, 0, \frac{t}{2} - \frac{1}{3} \rangle$

41. $\int_{-2}^2 (u^3i + u^5j)du = \left(\frac{u^4}{4}i + \frac{u^6}{6}j\right) \Big|_{-2}^2 = (0, 0)$

49. $r(t) = \frac{t^3}{3}i + \frac{5t^2}{2}j + t * k + c$

$r_{special}(t) = \frac{t^3-1}{3}i + \frac{5t^2-3}{2}j + (t + 1) * k$