

Ekstra oppgaver til kapittel 11.8

Ekstraoppgave 11.8.1. Tegn den parametriserte flaten.

- a) $\mathbf{r} = \langle \cos v, u \cdot \sin v, (u - 2)^2 \rangle$ for $u^2 + v^2 \leq 5^2$.
- b) $\mathbf{r} = \langle \sin u \cdot \cos v, \sin u \cdot \sin v, \cos u \rangle$ for $(u, v) \in [0, \pi] \times [0, 2\pi]$.
- c) $\mathbf{r} = \langle r \cdot \cos t, (r - 1)^2, \sin^2 t \rangle$ for $0 \leq r \leq 4, 0 \leq t \leq \pi$.
- d) $\mathbf{r} = \langle p \cdot \tan q, p^2 \cdot \sin q, p^3 \cdot \cos q \rangle$ for $(p, q) \in [0, 1] \times [0, \pi/4]$.
- e) $\mathbf{r} = \langle \cos x - 2 \cdot \cos y, \sin x - 2 \sin y, 3y \rangle$ for $0 \leq x \leq 2\pi, 0 \leq y \leq 3$.
- f) $\mathbf{r} = \langle x(\sin x) \cos y, x(\cos x) \cos y, x \sin y \rangle$ for $0 \leq x \leq 2\pi, 0 \leq y \leq \pi$.
- g) $\mathbf{r} = \langle (\sin 5p) \cdot \cos 7q, (\sin 7p) \cdot \sin 5q, (\cos 3p) \cdot \cos 5q \rangle$ for $0 \leq x \leq 2\pi, 0 \leq y \leq 2\pi$.

Ekstraoppgave 11.8.2. Tegn den parametriserte flaten og tangentplanet til flaten i det gitte punktet i ett og samme koordinatsystem.

- a) $\mathbf{r} = \langle u \cdot \cos v, u \cdot \sin v, u \cdot v \rangle$, for $(2, \pi/4)$.
- b) $\mathbf{r} = \langle x, y, x^2 + y^2 \rangle$, $(x, y) = (1, 1)$.
- c) $\mathbf{r} = \langle \sin s, \cos t, \cos(s \cdot t) \rangle$, $(s, t) = (\pi, \pi/2)$.
- d) $\mathbf{r} = \langle u, v, \sin(u \cdot v) \rangle$, $(u, v) = (\pi, \pi/2)$.
- e) $\mathbf{r} = \langle x, y, x^2 + y^2 \rangle$, $(x, y) = (1, -1)$.
- f) $\mathbf{r} = \langle p, q, x^2 + 2x + y^2 \rangle$, $(p, q) = (1, 0)$.