3.1 Določi definicijska območja in skiciraj grafe funkcij

$$\begin{aligned}
f_1(x) &= x^3 - 9x^2, \\
f_2(x) &= 4x - 4x^2 - x^3, \\
f_3(x) &= (-x^2 + 4x - 4)^{\frac{1}{4}}, \\
f_4(x) &= (\sin(x))^{\frac{1}{3}}, \\
f_5(x) &= (\cos(x))^{\frac{1}{4}}, \\
f_6(x) &= 2\cos(3x) - 1, \\
f_7(x) &= -\sin(2x + \pi), \\
f_8(x) &= 2\,\mathrm{tg}(x/4), \\
f_9(x) &= \exp(2x + 1) + 3, \\
f_{10}(x) &= \exp(|x|) - 2, \\
f_{11}(x) &= \log(|x| + 1), \\
f_{12}(x) &= 2\log(x) + 1, \\
f_{13}(x) &= \log(x^3 - 9x^2).
\end{aligned}$$

3.2 Izračunaj naslednje limite.

$$\begin{aligned}
&\lim_{x\to 0} \frac{\sin(7x)}{x}, \\
&\lim_{x\to 0} \frac{\sin(7x)\sin(8x)}{x^2}, \\
&\lim_{x\to 0} \frac{\sin(7x)\sin(8x)\sin(9x)}{x^3}, \\
&\lim_{x\to 2} \frac{\sqrt{x^2 + 2x - 2} - \sqrt{x^2 + 2}}{x - 2}, \\
&\lim_{x\to 3} \frac{\sqrt{x^2 + 3x - 3} - \sqrt{x^2 + 6}}{x - 3}, \\
&\lim_{x\to 4} \frac{\sqrt{x^2 + 2x - 4} - \sqrt{x^2 + 4}}{x - 4},
\end{aligned}$$

$$\lim_{x\to 5}\frac{\sqrt{x^2+3x}-\sqrt{x^2+15}}{x-5},$$
$$\lim_{x\to \infty}\sqrt{x^2+3x-3}-\sqrt{x^2+6},$$
$$\lim_{x\to \infty}\frac{5^{4x-3}-3x+2x^3}{4\cdot 5^{4x+1}+2x^4},$$
$$\lim_{x\to \infty}\frac{7^{2x}-5x+6x^6}{8\cdot 7^{2x+4}+2x^5},$$
$$\lim_{x\to \infty}(x^3+x^2+3)e^{-2x},$$
$$\lim_{x\to \infty}\frac{4^{5x-3}-2x+3x^2}{3\cdot 4^{5x-1}+3x^3},$$
$$\lim_{x\to \infty}\left(1+\frac{13}{3+3x^2}\right)^{3x^2+5},$$
$$\lim_{x\to \infty}\left(1+\frac{3x-4}{5x+2x^2}\right)^{2x+2},$$
$$\lim_{x\to \infty}\left(1+\frac{x+3}{2+4x^2}\right)^{5x-2}.$$