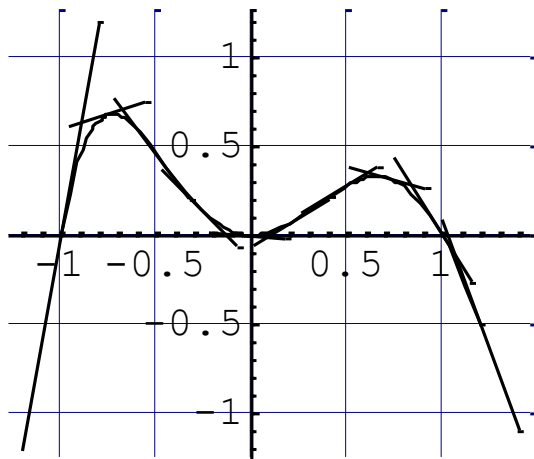
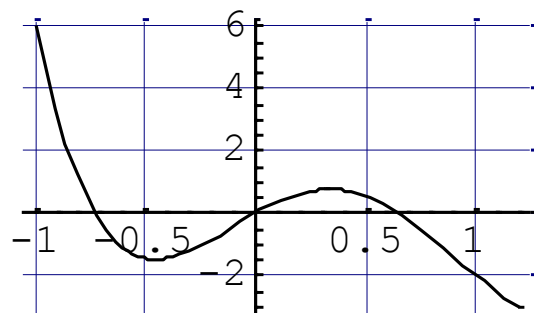


5. Derivált fogalma, grafikus jelentése



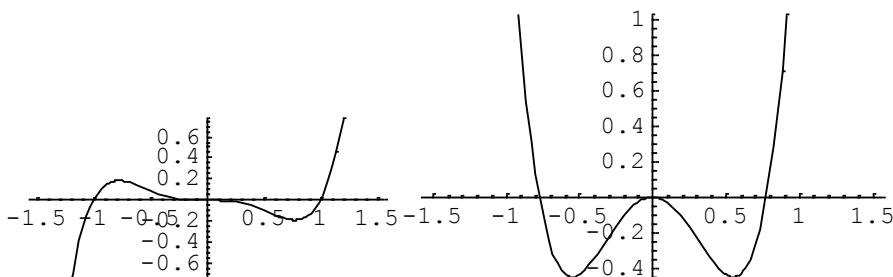
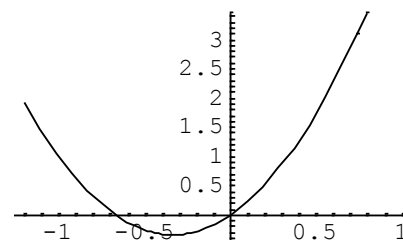
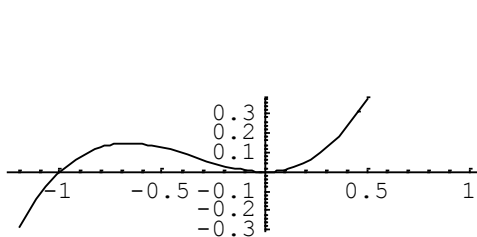
$f(x)$

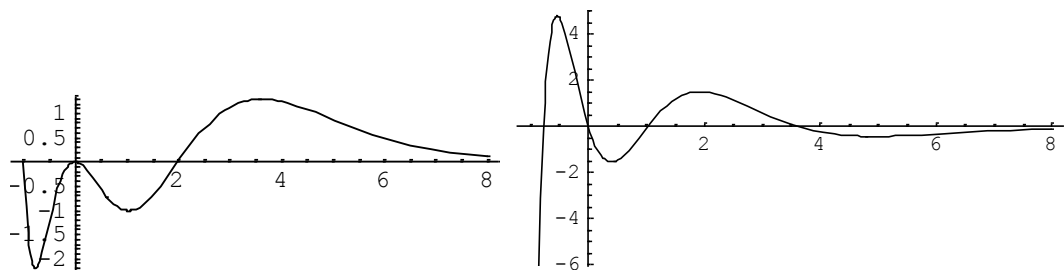
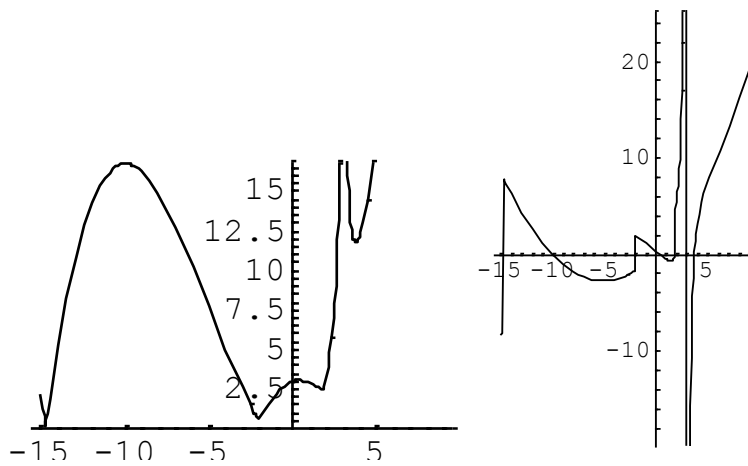
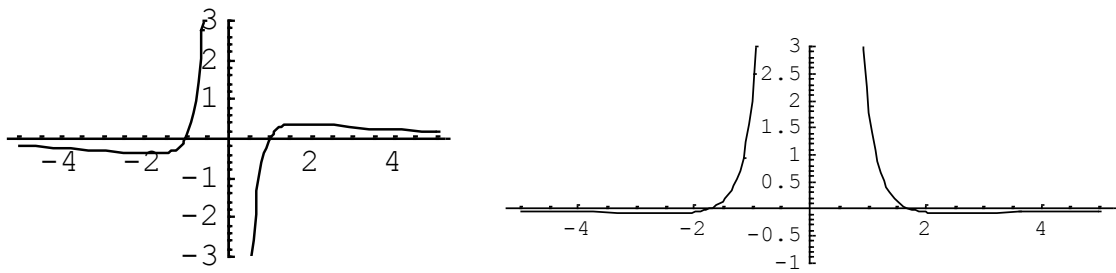
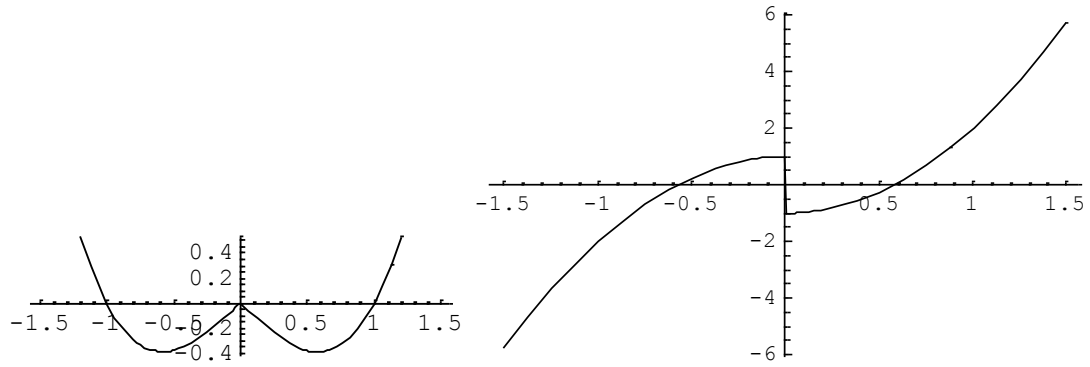


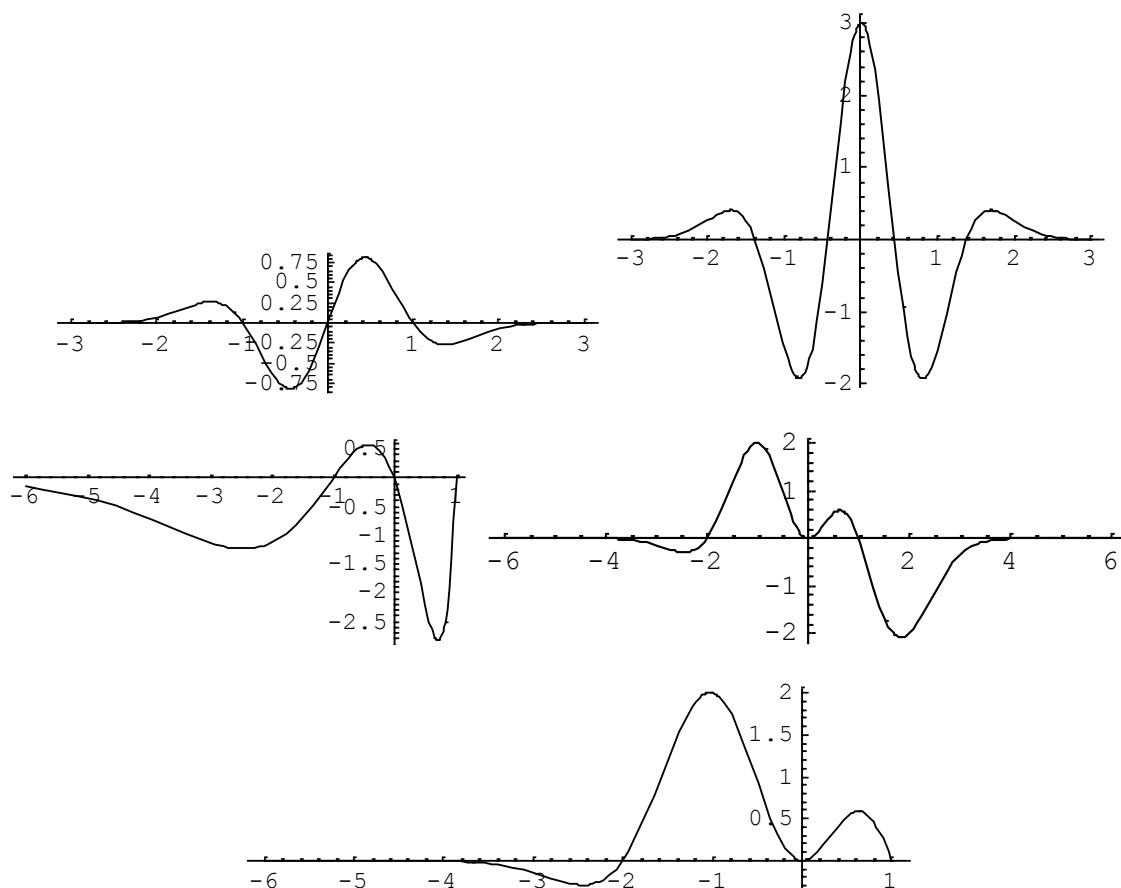
$f'(x)$

1. FELADAT

Ábrázolja az alábbi függvények deriváltját!

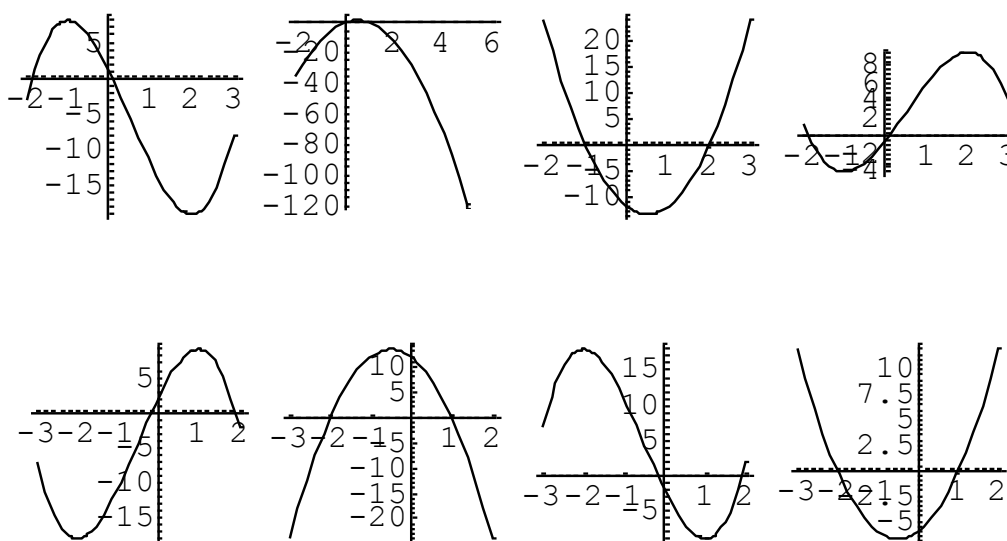


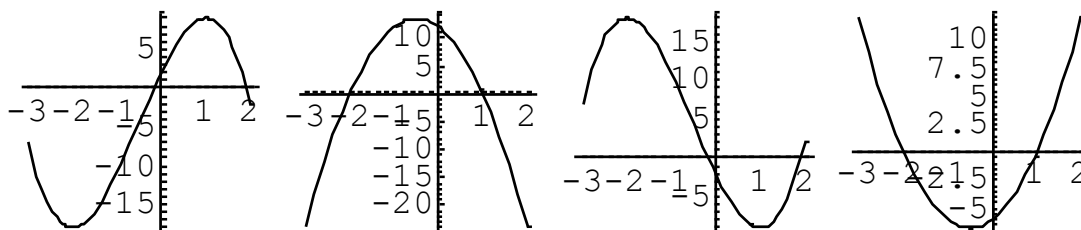
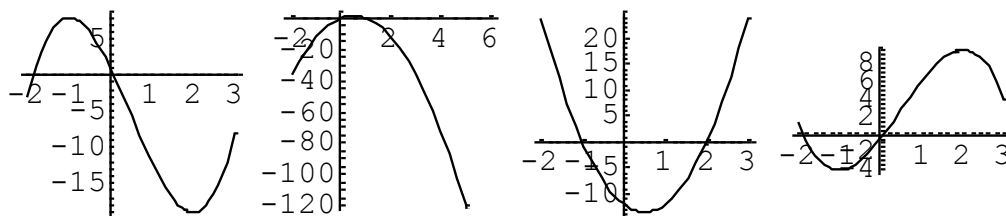




2. FELADAT

Az első ábra az f függvény grafikonja. Válassza ki a többi közül a derivált grafikonját:

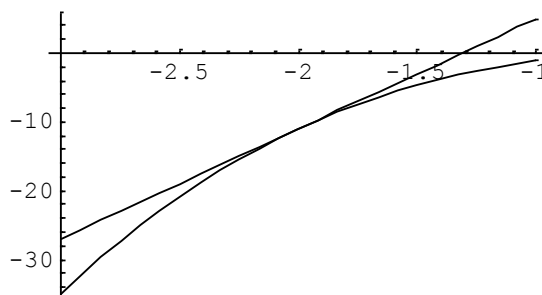




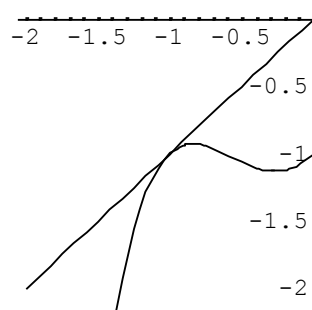
3. FELADAT

Írja fel az érintő egyenletét az adott helyen. Vázolja az érintő grafikonját is.

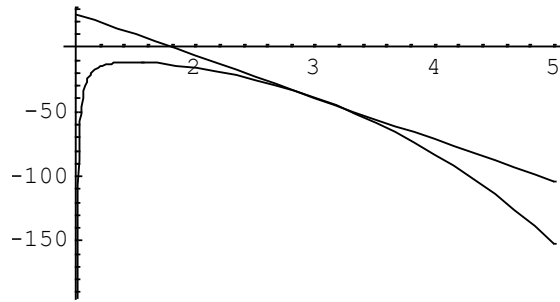
$$f(x) := x^3 - x^2 + 1; x_0 = -2;$$



$$f(x) := -x^4 + 2x^2 + x - 1; x_0 = -1;$$



$$f(x) := \frac{-x^4 + x^2 - 2x}{x - 1}; x_0 = 3;$$



4. FELADAT

Mekkora szöget zár be a két függvény grafikonja egymással metszéspontjaikban.

$$f(x) := 0.5 x^2; \quad g(x) := 4 - 0.5 x^2;$$

$$f(x) := x^2 + 4; \quad g(x) := (x + 2)^2;$$

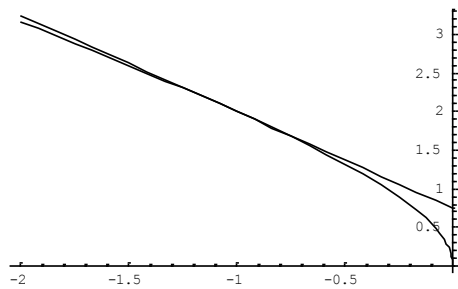
$$f(x) := x^2 + 4; \quad g(x) := x^2 + 4 x;$$

$$f(x) := \sqrt{|x|}; \quad g(x) := \frac{x^3}{8};$$

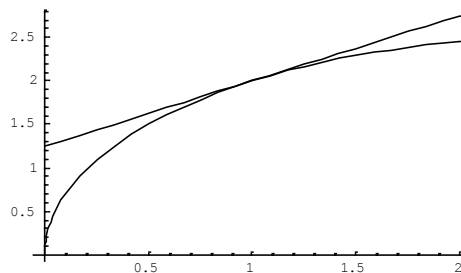
5. FELADAT

Közelítse az alábbi függvények x_1 -beli értékét az x_0 -ban húzott érintő értékével. Ábrázolja a függvényt és az érintőt.

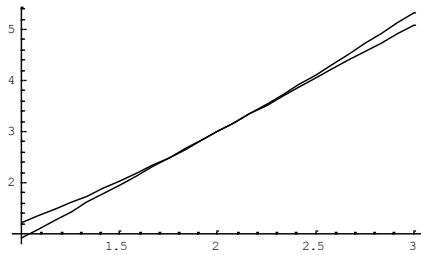
$$f(x) := \sqrt{x^2 - 3x}; \quad x_0 = -1; \quad x_1 = -0.97;$$



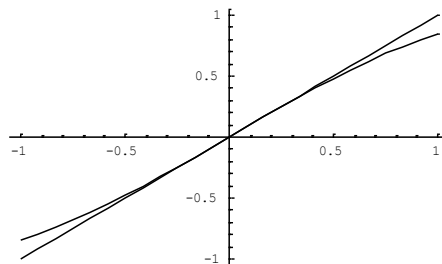
$$f(x) := \sqrt{5x - x^2}; \quad x_0 = 1; \quad x_1 = 0.95;$$



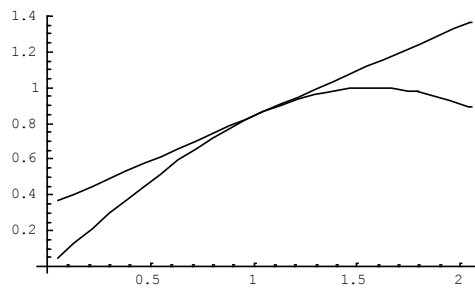
$$f(x) := \sqrt{x^3 + \frac{x}{2}}; \quad x_0 = 2; \quad x_1 = 2.01;$$



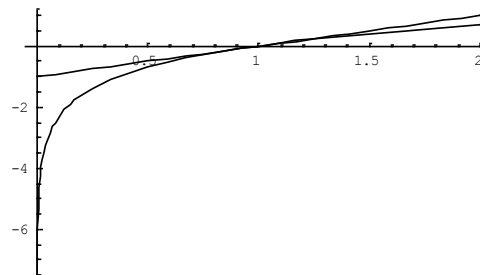
$$f(x) := \sin(x); \quad x_0 = 0; \quad x_1 = 0.1;$$



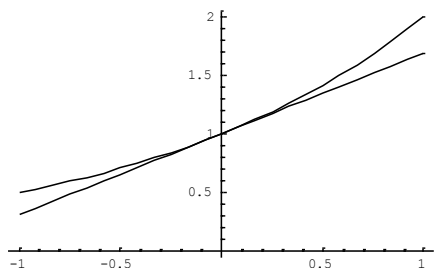
$$f(x) := \sin(x); \quad x_0 = \frac{\pi}{3}; \quad x_1 = \frac{\pi}{3} + 0.05;$$



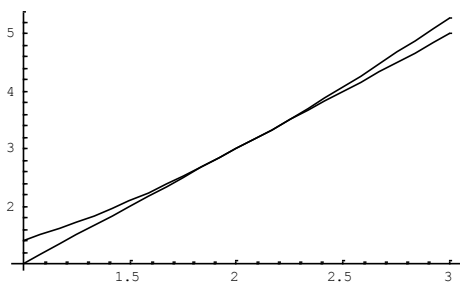
$$f(x) := \log(x); \quad x_0 = 1; \quad x_1 = 1.1;$$



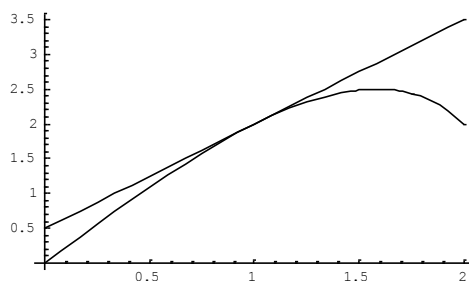
$$f(x) := 2^x; \quad x_0 = 0; \quad x_1 = 0.5;$$



$$f(x) := \sqrt{x^3 + 1}; x_0 = 2; x_1 = 2.1;$$



$$f(x) := \sqrt{5x^2 - x^4}; x_0 = 1; x_1 = 0.9;$$



6. FELADAT

Határozza meg az $f(x)$ függvény x_0 helyen vett érintőjének egyenletét! A + jelzésű feladatokban ábrázolja is a függvényt és az érintőt. Számítsa ki a függvény értékének közelítését az érintő segítségével, az $x=x_0+0,1$ vagy az $x=x_0-0,1$ helyen (tetszés szerint).

a+) $f(x) = \sqrt{x-1}$, $x_0 = 3$ b+) $f(x) = -\frac{x^2}{2} + 3x - 4$, $x_0 = 1$

c+) $f(x) = \frac{2x+5}{x+2}$, $x_0 = 0$ c+) $f(x) = 1 - \cos 2x$, $x_0 = \frac{\pi}{4}$

e) $f(x) = \ln(x^2 + 2x - 2)$, $x_0 = 1$ f) $f(x) = 2xe^{x+1} + 1$, $x_0 = -1$