(2) En els casos següents trobeu la derivada de la funció.

(a) $f(x) = \cos\sqrt{\sin(\tan \pi x)}$

$$f'(x) = \sin\left(\sqrt{\sin(\tan \pi x)}\right) \cdot \frac{1}{2\sqrt{\sin(\tan \pi x)}} \cdot \cos(\tan \pi x)\,(1+\tan^2(\pi x)) \cdot \pi$$

(b) $f(x) = \left(\frac{x+5}{x^2+2}\right)^2$

$$f'(x) = 2\left(\frac{x+5}{x^2+2}\right)\frac{x^2+2-(x+5)2x}{(x^2+2)^2} = \frac{2(x+5)}{(x^2+2)^3}(-x^2-10x+2)$$

(c) $f(x) = \sin\left(\sqrt[3]{x}\right) + \sqrt[3]{\sin x}$

$$f'(x) = \cos\left(\sqrt[3]{x}\right)\frac{1}{3}x^{-2/3} + \frac{1}{3}(\sin x)^{-2/3}\cos x = \frac{\cos(\sqrt[3]{x})}{3\sqrt[3]{x^2}} + \frac{\cos x}{3\sqrt[3]{(\sin x)^2}}$$

(d) $f(x) = (2+(x^2+1)^4)^3$

$$f'(x) = 3(2+(x^2+1)^4)\,4(x^2+1)^3\,2x = 24x(x^2+1)^3(2+(x^2+1)^4)$$

(e) $f(x) = \sqrt{2+\sqrt{2+\sqrt{x}}}$

$$f'(x) = \frac{1}{2\sqrt{2+\sqrt{2+\sqrt{x}}}} \cdot \frac{1}{2\sqrt{2+\sqrt{x}}} \cdot \frac{1}{2\sqrt{x}}$$

(f) $f(x) = \sec\left(\frac{x}{2}\right)\cdot\tan\left(\frac{x}{2}\right) = \frac{1}{\cos\left(\frac{x}{2}\right)} \cdot \frac{\sin(x/2)}{\cos(x/2)} = \frac{\sin(x/2)}{\cos^2(x/2)}$

$$f'(x) = \frac{1}{2}\left(\frac{\cos(x/2)}{\cos^2(x/2)} - 2\frac{\sin(x/2)(-\sin(x/2))}{\cos^3(x/2)}\right) = \frac{1}{2}\sec\left(\frac{x}{2}\right) + \sec\left(\frac{x}{2}\right)\tan\left(\frac{x}{2}\right)$$