



Soluciones

$$1. f'(x) = 6x - 6$$

$$2. f'(x) = \frac{1}{2\sqrt{x}} + \frac{1}{3\sqrt[3]{x^2}}$$

$$3. f'(x) = \frac{1}{\sqrt{2x}} + \frac{5}{3\sqrt[3]{5x}}$$

$$4. f(x) = x^{-3/2} \rightarrow f'(x) = -\frac{3}{2} x^{-5/2} = \frac{-3}{2\sqrt{x^5}} = \frac{-3}{2x^2\sqrt{x}}$$

$$5. f'(x) = \cos^2 x - \operatorname{sen}^2 x$$

$$6. f'(x) = 1 + \operatorname{tg}^2 x = \frac{1}{\cos^2 x}$$

$$7. f'(x) = e^x + x e^x = e^x(1 + x)$$

$$8. f'(x) = 2^x + x \cdot 2^x \cdot \ln 2 = 2^x(1 + x \ln 2)$$

$$9. f'(x) = 2x \log_2 x + (x^2 + 1) \cdot \frac{1}{x} \cdot \frac{1}{\ln 2} = 2x \log_2 x + \frac{(x^2 + 1)}{x \ln 2}$$

$$10. f'(x) = \frac{2x(x^2 - 1) - (x^2 + 1) 2x}{(x^2 - 1)^2} = \frac{2x^3 - 2x - 2x^3 - 2x}{(x^2 - 1)^2} = \frac{-4x}{(x^2 - 1)^2}$$

$$11. f'(x) = \frac{(3x^2 + 6x - 5)x - (x^3 + 3x^2 - 5x + 3)}{x^2} = \frac{2x^3 + 3x^2 - 3}{x^2} = 2x + 3 - \frac{3}{x^2}$$

$$12. f'(x) = \frac{[1/(\ln 10)] - \log x}{x^2} = \frac{1 - \ln 10 \log x}{x^2 \ln 10}$$

$$13. f'(x) = (\cos \sqrt{x}) \cdot \frac{1}{2\sqrt{x}}$$

$$14. f'(x) = (-\operatorname{sen} x^2) \cdot 2x = -2x \operatorname{sen} x^2$$

$$15. f'(x) = [1 + \operatorname{tg}^2(2x + \pi)] \cdot 2$$

$$16. f'(x) = 2 \operatorname{sen} x (\cos x) = 2 \operatorname{sen} x \cos x$$

$$17. f'(x) = e^{3x-5} \cdot 3 = 3e^{3x-5}$$

$$18. f'(x) = \frac{2x - 2}{1 + (x^2 - 2x)^2} = \frac{2x - 2}{x^4 - 4x^3 + 4x^2 + 1}$$



Soluciones

$$19. f'(x) = \frac{1}{\sqrt{x}} \cdot \frac{1}{2\sqrt{x}} = \frac{1}{2x}$$

O, de otro modo: $\ln \sqrt{x} = \ln x^{1/2} = \frac{1}{2} \ln x \rightarrow f'(x) = \frac{1}{2} \cdot \frac{1}{x}$

$$20. f'(x) = 2 \operatorname{sen} \left(3x + \frac{\pi}{2} \right) \cdot D \left[\operatorname{sen} \left(3x + \frac{\pi}{2} \right) \right]$$

$$D \left[\operatorname{sen} \left(3x + \frac{\pi}{2} \right) \right] = \cos \left(3x + \frac{\pi}{2} \right) \cdot D \left(3x + \frac{\pi}{2} \right) = \cos \left(3x + \frac{\pi}{2} \right) \cdot 3$$

Por tanto: $f'(x) = 2 \operatorname{sen} \left(3x + \frac{\pi}{2} \right) \cdot \cos \left(3x + \frac{\pi}{2} \right) \cdot 3$

$$21. f'(x) = (2x - 5) \cos(x^2 - 5x + 7)$$

$$22. f'(x) = \frac{2}{3} (5x + 3)^{-1/3} \cdot 5 = \frac{10}{3 \sqrt[3]{5x + 3}}$$

$$23. f'(x) = 3 [\cos^2(3x + 1) - \operatorname{sen}^2(3x + 1)]$$

$$24. f(x) = \frac{2 \log x}{x} \rightarrow f'(x) = \frac{2(1 - \ln 10 \log x)}{x^2 \ln 10}$$

$$25. f'(x) = -3 \operatorname{sen}(3x - \pi)$$

$$26. f'(x) = \frac{1}{\sqrt{1 + 2x}}$$

$$27. f'(x) = e^{2x+1} + x e^{2x+1} \cdot 2 = e^{2x+1} (1 + 2x)$$

$$28. f'(x) = \frac{2x \sqrt{1-x^2} \cos(x^2+1) + [x \operatorname{sen}(x^2+1)]/\sqrt{1-x^2}}{1-x^2} = \frac{2x(1-x^2) \cos(x^2+1) + x \operatorname{sen}(x^2+1)}{\sqrt{(1-x^2)^3}}$$