1. au34p01 - Calcula las siguientes derivadas:

(a) $y = 1200$

> **Sol:** $y' = 0$

(b) $y = 5x + 3$

> **Sol:** $y' = 5$

(c) $y = (-3)\,x^4 + 7x - 5$

> **Sol:** $y' = 7 - 12x^3$

(d) $y = \left(1 - x^3\right)\left(2x^2 + 5\right)$

> **Sol:** $y' = x\left(-10x^3 - 15x + 4\right)$

(e) $y = (3x + 1)^5$

> **Sol:** $y' = 15\,(3x + 1)^4$

(f) $y = \frac{1}{x}$

> **Sol:** $y' = -\frac{1}{x^2}$

(g) $y = \frac{x-1}{x+3}$

> **Sol:** $y' = \frac{4}{(x+3)^2}$

(h) $y = \frac{x^2}{x^3+1}$

> **Sol:** $y' = -\frac{x\left(x^3-2\right)}{x^6+2x^3+1}$

(i) $y = \frac{2}{x+1}$

> **Sol:** $y' = -\frac{2}{(x+1)^2}$

(j) $y = \frac{(-2)x^2+2x}{x^2+3}$

> **Sol:** $y' = \frac{-2x^2-12x+6}{x^4+6x^2+9}$

(k) $y = \frac{x^2-2x+1}{x^2-x}$

> **Sol:** $y' = \frac{1}{x^2}$

(l) $y = \frac{-1}{(x+2)^2}$

> **Sol:** $y' = \frac{2}{(x+2)^3}$

(m) $y = \frac{x^{\frac{2}{3}}x^{\frac{2}{6}}}{\sqrt[3]{x}}$

> **Sol:** $y' = \frac{2}{3\sqrt[3]{x}}$

(n) $y = \frac{16}{x^2(x-4)}$

> **Sol:** $y' = \frac{128-48x}{x^3(x^2-8x+16)}$

(ñ) $y = \frac{1}{x^2} + \frac{1}{x^3} - \frac{1}{x^4}$

> **Sol:** $y' = \frac{-2x^2-3x+4}{x^5}$

2. au34p02 - Calcula las siguientes derivadas:

(a) $y = \frac{3x}{\log(x)}$

> **Sol:** $y' = \frac{3(\log(x)-1)}{\log(x)^2}$

(b) $y = \sqrt{x^2 + 3}$

> **Sol:** $y' = \frac{x}{\sqrt{x^2+3}}$

(c) $y = \frac{1}{\sqrt{x+1}}$

> **Sol:** $y' = -\frac{1}{2(x+1)^{\frac{3}{2}}}$

(d)　$y = x\sqrt{x^2 - 1}$

Sol: $y' = \frac{2x^2 - 1}{\sqrt{x^2 - 1}}$

(e)　$y = 2\log(3x + 5)$

Sol: $y' = \frac{6}{3x + 5}$

(f)　$y = \log(x + 3)$

Sol: $y' = \frac{1}{x + 3}$

(g)　$y = \log(x^2 - 3x)$

Sol: $y' = \frac{2x - 3}{x(x - 3)}$

(h)　$y = \log\left(\frac{1}{x}\right)$

Sol: $y' = -\frac{1}{x}$

(i)　$y = \log\left(\frac{x + 1}{x^2 - 1}\right)$

Sol: $y' = -\frac{1}{x - 1}$

(j)　$y = 5\log\left(e^{x^3}\right)$

Sol: $y' = 15x^2$

(k)　$y = e^{x^2 + 2x - 1}$

Sol: $y' = 2(x + 1)e^{x^2 + 2x - 1}$

(l)　$y = e^{\log(x)}$

Sol: $y' = 1$

(m)　$y = e^{\frac{1}{x}}$

Sol: $y' = -\frac{e^{\frac{1}{x}}}{x^2}$

3. au34p03 - Calcula las siguientes derivadas:

(a)　$y = \left(x - \sqrt{1 - x^2}\right)^2$

Sol: $y' = \frac{2(2x^2 - 1)}{\sqrt{1 - x^2}}$

(b)　$y = \sqrt{\sqrt{x} + 1}$

Sol: $y' = \frac{1}{4\sqrt{x}\sqrt{\sqrt{x} + 1}}$

(c)　$y = \left(\frac{x^2 + 2}{4x + 2}\right)^2$

Sol: $y' = \frac{(x^2 + 2)\left(-x^2 + x(2x + 1) - 2\right)}{(2x + 1)^3}$

(d)　$y = \frac{x^6}{(3x + 2)^2}$

Sol: $y' = \frac{12x^5(x + 1)}{(3x + 2)^3}$

(e)　$y = \log(x^2 + 1)$

Sol: $y' = \frac{2x}{x^2 + 1}$

(f)　$y = \log\left(\frac{3 - 5x}{2x + 7}\right)$

Sol: $y' = \frac{41}{10x^2 + 29x - 21}$

(g)　$y = \log\left(\frac{x}{x^2 + 4}\right)$

Sol: $y' = \frac{4 - x^2}{x(x^2 + 4)}$

(h)　$y = e^{-x^2}$

Sol: $y' = -2xe^{-x^2}$

(i)　$y = e^{2x}\left(x^2 + 1\right)$

Sol: $y' = 2\left(x^2 + x + 1\right)e^{2x}$

4. au34p03cont - Calcula las siguientes derivadas:

(a) $y = e^{\sqrt{x}}$

> **Sol:** $y' = \frac{e^{\sqrt{x}}}{2\sqrt{x}}$

(c) $y = e^{\log\left(x^3\right)}$

> **Sol:** $y' = 3x^2$

(b) $y = \frac{e^x}{e^x + 1}$

> **Sol:** $y' = \frac{e^x}{e^{2x} + 2e^x + 1}$

(d) $y = \frac{e^x}{x+1}$

> **Sol:** $y' = \frac{xe^x}{x^2 + 2x + 1}$

5. au34p04 - Calcula las siguientes derivadas:

(a) $y = e^{-\sin(x)}$

> **Sol:** $y' = -e^{-\sin(x)}\cos(x)$

> **Sol:** $y' = -(2x+2)\sin\left((x+1)^2\right)$

(b) $y = x^2 \sin(x)$

> **Sol:** $y' = x\left(x\cos(x) + 2\sin(x)\right)$

(f) $y = \frac{\log\left(\cos(x-1)\right)}{\log(2)}$

> **Sol:** $y' = -\frac{\tan(x-1)}{\log(2)}$

(c) $y = x^3 \cos(x)$

> **Sol:** $y' = x^2\left(-x\sin(x) + 3\cos(x)\right)$

(g) $y = 5\sin^2(x)$

> **Sol:** $y' = 5\sin(2x)$

(d) $y = \sin(x)\cos(x)$

> **Sol:** $y' = \cos(2x)$

(h) $y = 2\sin(\cos(3x))$

> **Sol:** $y' = -6\sin(3x)\cos(\cos(3x))$

(e) $y = \cos\left((x+1)^2\right)$

6. au34p05 - Calcula las siguientes derivadas, siendo a un número cualquiera:

(a) $y = \frac{a + \sqrt{x}}{a - \sqrt{x}}$

> **Sol:** $y' = \frac{a}{\sqrt{x}\left(a - \sqrt{x}\right)^2}$

> **Sol:** $y' = a\left(2x + \cos(ax)\right)$

(c) $y = \log\left(\frac{a-x}{a+x}\right)$

> **Sol:** $y' = \frac{2a}{-a^2 + x^2}$

(b) $y = ax^2 + \sin(ax)$