SOLUCIONES.

452 $$y' = \frac{1}{e^x + 5\,\text{sen}\,x - 4\,\text{arcsen}\,x} \cdot \left(e^x + 5\cos x - \frac{4}{\sqrt{1-x^2}}\right)$$

453 $$y' = \frac{1}{1+(\ln x)^2} \cdot \frac{1}{x} + \frac{1}{\text{arctg}\,x} \cdot \frac{1}{1+x^2}$$

454 $$y' = \frac{1}{2\sqrt{\ln x+1}} \cdot \frac{1}{x} + \frac{1}{\sqrt{x+1}} \cdot \frac{1}{2\sqrt{x}}$$

455 $$y' = 3\,\text{sen}^2 5x \cdot \cos 5x \cdot 5 \cdot \cos^2\frac{x}{2} + 2\cos\frac{x}{3} \cdot \left(-\text{sen}\,\frac{x}{3}\right) \cdot \frac{1}{3} \cdot \text{sen}^3 5x$$

456 $$y' = -\frac{11}{2} \cdot (-2) \cdot \frac{1}{(x-2)^3} - 4\,\frac{-1}{(x-2)^2}$$

457 $$y' = -\frac{15}{4} \cdot (-4) \cdot \frac{1}{(x-3)^5} - \frac{10}{3}(-3)\,\frac{1}{(x-3)^4} - \frac{1}{2}(-2) \cdot \frac{1}{(x-3)^3}$$

458 $$y' = \frac{8x^7 \cdot 8(1-x^2)^4 - x^8 \cdot 8 \cdot 4 \cdot (1-x^2)^3\,(-2x)}{\left(8(1-x^2)^4\right)^2}$$

459 $$y' = \frac{\frac{1}{2\sqrt{2x^2-2x+1}}\,(4x-2) \cdot x - \sqrt{2x^2-2x+1}}{x^2}$$

460 $$y' = \frac{a^2\sqrt{a^2+x^2} - x \cdot \frac{a^2}{\sqrt{a^2+x^2}} \cdot 2x}{\left(a^2 \cdot \sqrt{a^2+x^2}\right)^2}$$

461 $$y' = \frac{3x^2 \cdot 3\sqrt{(1+x^2)^3} - x^3 \cdot \frac{1}{2\sqrt{(1+x^2)^3}} \cdot 3(1+x^2)^2 \cdot 2x}{9(1+x^2)^3}$$

462 $$y' = \frac{3}{2} \cdot \frac{2}{3} \cdot x^{-1/3} + \frac{18}{7}\left(\sqrt[6]{x} + x \cdot \frac{1}{6}x^{-5/6}\right) + \frac{9}{5}\left(\frac{2}{3}x^{-1/3} \cdot x + \sqrt[3]{x^2}\right) +$$
$$+ \frac{6}{13}\left(2x\sqrt[6]{x} + x^2 \cdot \frac{1}{6}x^{-5/6}\right)$$

463 $$y' = \frac{1}{8} \cdot \frac{8}{3}\,(1+x^3)^{5/3} \cdot 3x^2 - \frac{1}{5}\,\frac{5}{3}\,(1+x^3)^{2/3} \cdot 3x^2$$

464 $$y' = \frac{4}{3} \cdot \frac{1}{4}\left(\frac{x-1}{x+2}\right)^{-3/4} \cdot \left[\frac{x+2-(x-1)}{(x+2)^2}\right]$$

465 $$y' = 4x^3(a+2x^3)^2 + x^4 \cdot 2(a-2x^3) \cdot (-2 \cdot 3x^2)$$

466 $$y' = m\left(\frac{a+bx^m}{a-bx^m}\right)^{m-1} \cdot \frac{m \cdot b \cdot x^{m-1}(a-bx^m) - (a+bx^m) \cdot (-bmx^{m-1})}{(a-bx^m)^2}$$

467 $$y' = \frac{9}{5} \cdot \frac{(-5)}{(x+2)^6} - 3 \cdot \frac{(-4)}{(x+2)^5} + 2\,\frac{(-3)}{(x+2)^4} - \frac{1}{2}\,\frac{(-2)}{(x+2)^3}$$

468 $$y' = \sqrt{a-x} + (a+x) \cdot \frac{1}{2\sqrt{a-x}}\,(-1).$$

469 $y' = \frac{1}{2\sqrt{(x+a)(x+b)(x+c)}} \cdot \left[(x+b)(x+c) + (x+a)(x+c) + (x+a)(x+b)\right]$

470 $z' = 0$ (si derivamos respecto a x) ó
$z' = \frac{1}{3}\left(y+\sqrt{y}\right)^{-2/3} \cdot \left(1+\frac{1}{2\sqrt{y}}\right)$ si lo hacemos respecto a y

471 $f'(t) = 2(3t+2)\cdot\sqrt[3]{3t+2} + (2t+1)\cdot 3\sqrt[3]{3t+2} + (2t+1)(3t+2)\cdot\frac{1}{3}(3t+2)^{-2/3}\cdot 3$

472 $x' = \frac{-1}{2ay-y^2}\cdot\frac{1}{2\sqrt{2ay-y^2}}\cdot(2a-2y)$

473 $y' = \frac{1}{\sqrt{1+e^x}-1}\cdot\frac{1}{2\sqrt{1+e^x}}\cdot e^x - \frac{1}{\sqrt{1+e^x}+1}\cdot\frac{1}{2\sqrt{1+e^x}}\cdot e^x$

474 $y' = \frac{1}{15}\left[3\cos x(-\operatorname{sen} x)(3\cos^2 x - 5) + \cos^3 x \; 3\cdot 2\cos x(-\operatorname{sen} x)\right]$

475 $y' = \dfrac{\left(2\operatorname{tg}x\cdot\frac{1}{\cos^2 x}\left(\operatorname{tg}^4x+10\operatorname{tg}^2x+1\right)+\left(\operatorname{tg}^2x-1\right)\left(4\operatorname{tg}^3x+10\cdot 2\operatorname{tg}x\right)\cdot\frac{1}{\cos^2x}\right)\cdot 3\operatorname{tg}^3x - \left(\operatorname{tg}^2x-1\right)\left(\operatorname{tg}^4x+10\operatorname{tg}^2x+1\right)\cdot 3\cdot 3\operatorname{tg}^2x\cdot\frac{1}{\cos^2x}}{9\operatorname{tg}^6x}$ ← todo dividido por:

476 $y' = 2\operatorname{tg}5x\cdot\frac{1}{\cos^2 5x}\cdot 5$

477 $y' = \frac{1}{2}\cos x^2\cdot 2x$

478 $y' = 0$ (si derivo respecto a x) $y' = 2\operatorname{sen} t^3 \cos t^3\cdot 3t^2$ (si lo hago respecto a t.

479 $y' = 3\left(\cos^3 x - 2\operatorname{sen}^2 x\cos x\right) + 3\operatorname{sen}^2 x\cos x$

480 $y' = \frac{1}{3}\cdot 3\operatorname{tg}^2 x\cdot\frac{1}{\cos^2 x} - \frac{1}{\cos^2 x} + 1$

481 $y' = -\frac{1}{3}\left(\frac{-\operatorname{sen}x\cdot\operatorname{sen}^3x - \cos x\cdot 3\operatorname{sen}^2x\cos x}{\operatorname{sen}^6 x}\right) + \frac{4}{3}\cdot\frac{-1}{\operatorname{sen}^2x}$

482 $y' = \frac{1}{2\sqrt{\alpha\operatorname{sen}^2x+\beta\cos^2x}}\cdot\left(2\alpha\operatorname{sen}x\cos x + 2\beta\cos x(-\operatorname{sen}x)\right)$

483 $y' = \frac{1}{\sqrt{1-x^4}}\cdot 2x - \frac{1}{\sqrt{1-x^4}}\cdot 2x = 0$

484 $y' = \frac{1}{2}\left[2\operatorname{arcsen}x\cdot\frac{1}{\sqrt{1-x^2}}\cdot\arccos x + \operatorname{arcsen}^2x\cdot\frac{-1}{\sqrt{1-x^2}}\right]$

485 $y' = \frac{1}{\sqrt{1-\left(\frac{x^2-1}{x^2}\right)^2}}\cdot\left(\frac{2x\cdot x^2-(x^2-1)\cdot 2x}{x^4}\right)$

486 $y' = \frac{1}{\sqrt{1-\frac{x^2}{1+x^2}}}\cdot\left(\frac{\sqrt{1+x^2}-x\cdot\frac{1}{2\sqrt{1+x^2}}\cdot 2x}{1+x^2}\right)$

487 $$y' = \frac{\frac{-1}{\sqrt{1-x^2}}\sqrt{1-x^2} - \arccos x \cdot \frac{1}{2\sqrt{1-x^2}} \cdot (-x^2)}{(1-x^2)}$$

488 $$y' = \frac{1}{\sqrt{b}} \quad \frac{1}{\sqrt{1-\frac{b}{a}x^2}} \cdot \sqrt{\frac{b}{a}}$$

489 $$y' = \frac{1}{2\sqrt{a^2-x^2}}(-2x) + a \cdot \frac{1}{\sqrt{1-\frac{x^2}{a^2}}} \cdot \frac{1}{a}$$

490 $$y' = \sqrt{a^2-x^2} + x \cdot \frac{1}{2\sqrt{a^2-x^2}}(-2x) + a^2 \cdot \frac{1}{\sqrt{1-\frac{x^2}{a^2}}} \cdot \frac{1}{a}$$

491 $$y' = \frac{1}{\sqrt{1-(1-x)^2}}(-1) + \frac{1}{2\sqrt{2x-x^2}}(2-2x)$$

492 $$y' = \operatorname{arcsen}\sqrt{x} + \left(x-\frac{1}{2}\right) \cdot \frac{1}{\sqrt{1-x}} \cdot \frac{1}{2\sqrt{x}} + \frac{1}{2} \cdot \frac{1}{2\sqrt{x-x^2}}(1-2x)$$

493 $$y' = \frac{1}{\operatorname{arcsen} 5x} \cdot \frac{1}{\sqrt{1-(5x)^2}} \cdot 5$$

494 $$y' = \frac{1}{\sqrt{1-\operatorname{Ln}^2 x}} \cdot \frac{1}{x}$$

495 $$y' = \frac{1}{1+\left(\frac{x \operatorname{sen}\alpha}{1-x\cos\alpha}\right)^2} \cdot \left(\frac{\operatorname{sen}\alpha\,(1-x\cos\alpha) - x\operatorname{sen}\alpha(-\cos\alpha)}{(1-x\cos\alpha)^2}\right)$$

496 $$y' = \frac{2}{3} \quad \frac{1}{1+\left(\frac{5\operatorname{tg}\frac{x}{2}+4}{3}\right)^2} \cdot \frac{1}{3} \cdot 5 \cdot \frac{1}{\cos^2\frac{x}{2}} \cdot \frac{1}{2}$$

497 $$y' = \frac{3b^2}{1+\frac{x}{b-x}} \cdot \left[\frac{(b-x) - x(-1)}{(b-x)^2}\right] - 2$$

498 $$y' = -\sqrt{2} \cdot \frac{1}{1+\frac{\operatorname{tg}^2 x}{2}} \cdot \frac{1}{\sqrt{2}} \cdot \frac{1}{\cos^2 x} - 1$$

499 $$y = e^{\frac{ax}{2}} \qquad y' = e^{\frac{ax}{2}} \cdot \frac{a}{2}$$

500 $$y' = e^{\operatorname{sen}^2 x} \cdot 2\operatorname{sen}x\cos x$$

501 $$y' = p\left(2m\,a^{mx}+b\right)^{p-1} \cdot 2m\,a^{mx} \cdot m\operatorname{Ln}a$$

502 $F(t) = 0$ (si derivo respecto a x) ó

$$F'(t) = e^{\alpha t} \cdot \alpha \cdot \cos\beta t + e^{\alpha t}(-\operatorname{sen}\beta t) \cdot \beta$$

503 $$y' = \frac{(\alpha \cos\beta x \cdot \beta - \beta(-\operatorname{sen}\beta x) \cdot \beta)\, e^{\alpha x} + (\alpha\operatorname{sen}\beta x - \beta\cos\beta x) \cdot e^{\alpha x} \cdot \alpha}{\alpha^2+\beta^2}$$

504 $$y' = \frac{1}{10}\left[e^{-x}(-1)(3\operatorname{sen}3x - \cos 3x) + e^{-x}(3\cos 3x \cdot 3 + \operatorname{sen}3x \cdot 3)\right]$$

505 $$y' = n\,x^{n-1}a^{-x^2} + x^n \cdot a^{-x^2}(-2x)\operatorname{Ln}a$$

506 $$y' = \frac{1}{2\sqrt{\cos x}}(-\operatorname{sen}x) \cdot a^{\sqrt{\cos x}} + \sqrt{\cos x} \cdot a^{\sqrt{\cos x}} \cdot \frac{1}{2\sqrt{\cos x}}(-\operatorname{sen}x) \cdot \operatorname{Ln}a$$

507 $y' = 3^{\operatorname{ctg}\frac{1}{x}} \cdot \left(\frac{-1}{\operatorname{sen}^2\frac{1}{x}}\right) \cdot \left(\frac{-1}{x^2}\right) \cdot \ln 3.$

508 $y' = \dfrac{2ax + b}{ax^2 + bx + c}$

509 $y' = \dfrac{1}{x + \sqrt{a^2 + x^2}} \left(1 + \dfrac{1}{2\sqrt{a^2+x^2}} \cdot 2x\right)$

510 $y' = 1 - 2 \cdot \dfrac{1}{2\sqrt{x}} + 2 \cdot \dfrac{1}{1+\sqrt{x}} \cdot \dfrac{1}{2\sqrt{x}}$

511 $y' = \dfrac{1}{a + x + \sqrt{2ax + x^2}} \cdot \left(1 + \dfrac{1}{2\sqrt{2ax+x^2}}(2a + 2x)\right)$

512 $y' = \dfrac{-2}{\ln^3 x} \cdot \dfrac{1}{x}.$

513 $y' = \dfrac{1}{\cos\frac{x-1}{x}} \cdot \left(-\operatorname{sen}\frac{x-1}{x}\right) \cdot \left(\dfrac{x-(x-1)}{x^2}\right)$

514 $y = \ln (x-2)^5 - \ln (x+1)^3 = 5\ln(x-2) - 3\ln(x+1)$

$y' = \dfrac{5}{x-2} - \dfrac{3}{x+1}$

515 $y = \ln (x-1)^3 \cdot (x-2) - \ln(x-3) =$

$= \ln(x-1)^3 + \ln(x-2) - \ln(x-3) = 3\ln(x-1) + \ln(x-2) - \ln(x-3)$

$y' = \dfrac{3}{x-1} + \dfrac{1}{x-2} - \dfrac{1}{x-3}$

516 $y' = -\dfrac{1}{2}\dfrac{(-2)}{\operatorname{sen}^3 x} \cdot \cos x + \dfrac{1}{\operatorname{tg} x} \cdot \dfrac{1}{\cos^2 x}$

517 $y' = \dfrac{1}{2} \cdot \sqrt{x^2 - a^2} + \dfrac{x}{2} \cdot \dfrac{1}{2\sqrt{x^2 - a}} \cdot 2x - \dfrac{a^2}{2} \cdot \dfrac{1}{x + \sqrt{x^2 - a^2}} \cdot$

$\cdot \left(1 + \dfrac{1}{2\sqrt{x^2 - a^2}} \cdot 2x\right)$

518 $y' = \dfrac{1}{\ln(3 - 2x^3)} \cdot \dfrac{1}{3 - 2x^3} \cdot (-6x^2)$

519 $y' = 15 \ln^2(ax + b) \cdot \dfrac{1}{ax + b} \cdot a$

520 $y = \ln\left(\sqrt{x^2 + a^2} + x\right) - \ln\left(\sqrt{x^2+a^2} - x\right)$

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

521 $y' = \dfrac{m}{2} \dfrac{1}{x^2 - a^2} \cdot 2x + \dfrac{m}{2a} \dfrac{x+a}{x-a} \cdot \left(\dfrac{x - a - (x+a)}{(x-a)^2}\right)$

522 $y' = \operatorname{sen}(\ln x - \pi/4) + x \cdot \cos\left(\ln x - \frac{\pi}{4}\right) \cdot \dfrac{1}{x}$

523 $$y' = \frac{1}{2} \cdot \frac{1}{tg\frac{x}{2}} \cdot \frac{1}{\cos^2\frac{x}{2}} \cdot \frac{1}{2} - \frac{1}{2}\left[\frac{-\operatorname{sen}x \cdot \operatorname{sen}^2 x - \cos x \, 2\operatorname{sen}x \cos x}{\operatorname{sen}^4 x}\right]$$

529 $$y' = \frac{1}{1+\operatorname{Ln}^2 x} \cdot \frac{1}{x}$$

530 $$y' = \frac{1}{\operatorname{arcsen}x} \cdot \frac{1}{\sqrt{1-x^2}} + \frac{1}{2} \cdot 2\operatorname{Ln}x \cdot \frac{1}{x} + \frac{1}{\sqrt{1-\operatorname{Ln}^2 x}} \cdot \frac{1}{x}$$

531 $$y' = \frac{1}{1+\operatorname{Ln}^2\frac{1}{x}} \cdot x \cdot \left(\frac{-1}{x^2}\right)$$

<u>DISCULPA POSIBLES ERRORES</u>