6) $f(x) = \left[\frac{f}{g}\right]$ $f'(x) = \frac{f'g - fg'}{g^2}$

ejemplo

$f(x) = \frac{4x+1}{10x^2-5}$ $= \frac{20x(4x+1) - 4(10x^2-5)}{(10x^2-5)^2}$

1) $f(x) = \frac{5x^2+4x}{6x^3}$ $\frac{18x^2(5x^2+4x) - (10x+4)(6x^3)}{(6x^3)^2}$

2) $f(x) = \frac{3x^5-7x^4}{2x}$ $\frac{4(3x^5-7x^4) - (15x^4-28)(2x)}{(2x)^2}$

3) $f(x) \frac{10x^2+5x}{15x-2}$ $\frac{15(10x^2+5x) - (20x+5)(15x-2)}{(15x-2)^2}$

4) $f(x) \frac{2x^{10}}{2x^5}$ $\frac{10x^4(2x^{10}) - 20x^9(2x^5)}{(2x^5)^2}$

5) $f(x) = \frac{58x}{60x}$ $\frac{60(58x) - 58(60x)}{(60x)^2}$

TEOREMA

La derivada de 1 potencia entera de 1 función sea:

$y = [f(x)]^n$ entonces:

$y' = n[f(x)]^{n-1} f'(x)$

$f(x) = (2x+3)^3$

$f'(x) = (3)(2x+3)^{3-1}(2)$

$f'(x) = (3)(2x+3)^2(2)$

$f'(x) = (6)(2x+3)^2$

1) $f(x) = (3x^4 - 5)^2$

$(-5)(3x^4-5)^1(12x^3) = (24x^3)(3x^4-5)$

2) $f(x) = (x+2)^3$

$(1)(x+2)(3) = 3(x+2)^2$

3) $f(x) = (6x^2-5x+4)^4$

$(4)(6x^2-5x+4)^3(12x-5) = (48x-20)(6x^2-5x+4)^3$

4) $f(x) = (2x_4-3)^5$

$5(2) = 10(2x4-3)^4$

5) $f(x) = (5x^2+4y-3)^2$

$2(10x+4) = (20x+8)(5x^2+4y-3)$

1.- $3x^2 = 6x$

2.- $f(x) = 5 = 0$

3.- $f(x) = -2x = -2$

4.- $f(x) = -2x + 2 = -2$

5.- $f(x) = 4x^3 + 6x = 12x^2 + 6$

6.- $f(x) = 8x^6 = 48x^5$

7.- $f(x) = 7 = 0$

8.- $f(x) = (3x^3 + 2x) + (6x^4 + 6)$

$24x^3 (3x^3 + 2x) + 9x^2 + 2(6x^4 + 6)$

9.- $f(x) = (8x + 2) - (3x^2 - x)$

$6x - 1(8x + 2) - 8(3x^3 - x)$

10.- $f(x) = (7x^4 + 6x^3 - 5x^2 + x)^3$

$3(28x^3 + 18x^2 - 10x + 1)^2$

$(84x^3 + 54x^2 - 30x + 3)(7x^4 + 6x^3 - 5x^2 + x)^2$

11.- $f(x) = \frac{8x^6 - 6x^3 - 4}{2x^4}$

$\frac{8x^3(8x^6 - 6x^3 - 4) - (48x^5 - 18x^2)(2x^4)}{(2x^4)^2}$

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

$\frac{12x + 1(2x^3 - x^2) - (6x^2 - 2x)(6x^2 + x + 2)}{(6x^2 + x + 2)^2}$

13.- $f(x) = 78 = 0$

14.- $f(x) = (2x^3 + 5x^2 + 6x)^4$

$4(6x^2 + 10x + 6)^3$

$(24x^2 + 40x + 24)(2x^3 + 5x^2 + 6x)^3$

15.- $f(x) = -2x^2 + 2 = 4x$

DOMINIO FÍSICO

1.- $(x = 5x + 3, f(x))$

$f(x) = (5x + 3)$ $\lim_{x \to 8} x = 8$

$f(x) = 5$

2.- $(x = 5x^2, f(x))$

$f(x) = 5x^2$ $\lim_{x \to 5} 5(1)^2 = 5$

$f(x) = 10x$

3.- $(x = 2x^3, f(x))$

$f(x) = 2x^3$ $\lim_{x \to 8} 2(1)^3 = 2$

$f(x) = 6x^2$

4.- $(x = 7x, f(x))$

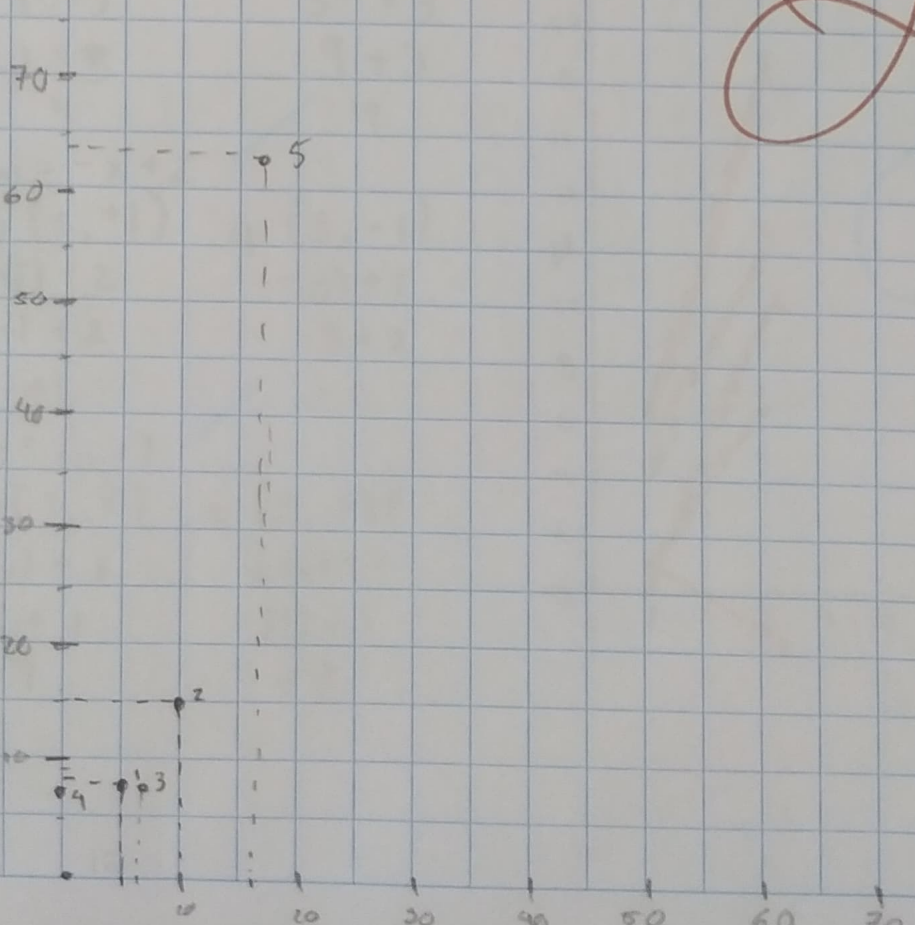
$f(x) = 7x$ $\lim_{x \to 7} 7(1) = 7$

$f(x) = 0$

5.- $(x = 8x^2, f(x))$

$f(x) = 8x^2$ $\lim_{x \to 64} 8(1)^2 = 8$

$f(x) = 16$



$f(x) = 2x - 1$

Si $f(x)$ $p(0, -1)$

$2(0) - 1$

$0 - 1$

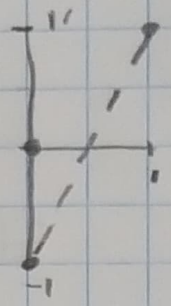
$x = -1$

Si $f(1)$ $q(1, 1)$

$2(1) - 1$

$2 - 1$

$x = 1$



- Actividades

Si $f(1)$ Si $f(3)$

1) $f(x) = 3x - 2$

$p(1, 1)$ $q(3, 7)$

$3(1) - 2$ $3(3) - 2$

$3 - 2$ $9 - 2$

1 7

2) $f(x) = x^2 + 3$

$p(1, 4)$ $q(3, 12)$

$1^2 + 3$ $3^2 + 3$

$1 + 3$ $9 + 3$

4 12

3) $f(x) = -x + 2$

$p(1, +1)$ $q(3, -1)$

$-(1) + 2$ $-(3) + 2$

$-1 + 2$ $-3 + 2$

$+1$ -1

4) $f(x) = 6x + 1$

$p(1, 7)$ $q(3, 19)$

$6(1) + 1$ $6(3) + 1$

$6 + 1$ $18 + 1$

7 19

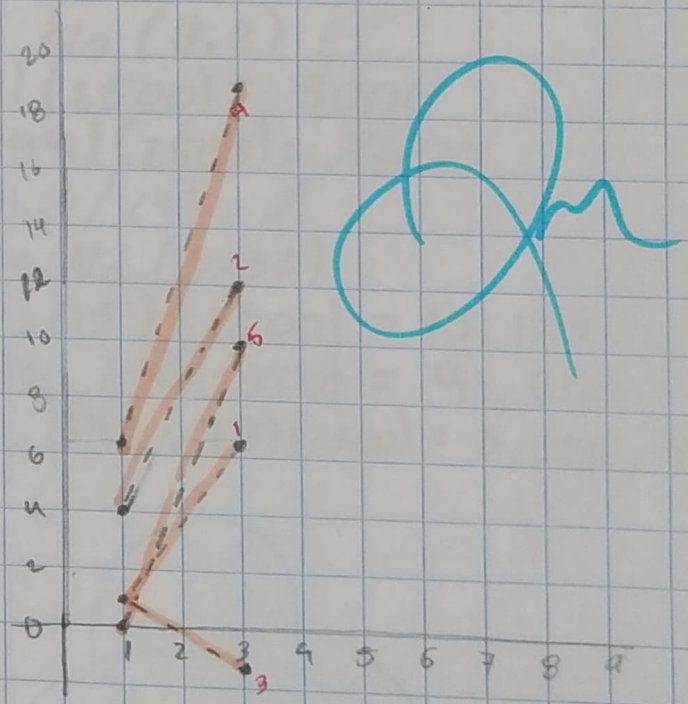
5) $f(x) = 5x - 5$

$p(1, 0)$ $q(3, 10)$

$5(1) - 5$ $5(3) - 5$

$5 - 5$ $15 - 5$

0 10



Cultivo MO ↑ 50% c/1 hr

$\therefore N_0 = 2500$ UFC

$$N(t) = N(t)^h$$

$$N(1) = N_0 + 0.5 N_0 = N_0 (1.5)^h$$

$$N(2) = N_0 (1.5)^2$$

1) MO ↑ 85% c/h 3 hrs y 4 hrs

$$N(t) = N_0 + 0.85 N_0 = N_0 (0.85)$$

$$N(3) = (0.85)^3 = (6.33)(2500) = 15,825$$

$$N(4) = (0.85)^4 = (11.71)(2500) = 29,275$$

2) MO ↑ 60% c/h 1 hr y 5 hrs

$$N(t) = N_0 + 0.6 N_0 = N_0 (0.6)$$

$$N(1) = (0.6)^1 = (1.6)(2500) = 4,000$$

$$N(5) = (0.6)^5 = (10.48)(2500) = 26,200$$

3) MO ↑ 20% c/h 1 hr y 2 hrs

$$N(t) = N_0 + 0.2 N_0 = N_0 (0.2)$$

$$N(1) = (0.2)^1 = (1.2)(2500) = 3,000$$

$$N(2) = (0.2)^2 = (1.44)(2500) = 3,600$$

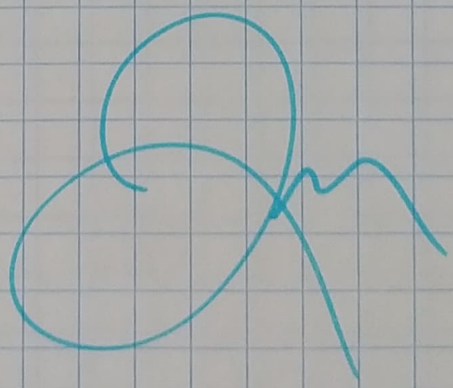
4) MO ↑ 35% c/h 6 hrs / 12 hrs / 24 hrs

$$N(t) = N_0 + 0.35 N_0 = N_0 (0.35)$$

$$N(6) = (1.35)^6 = (6.05)(2500) = 15,125$$

$$N(12) = (1.35)^{12} = (36.64)(2500) = 91,600$$

$$N(24) = (1.35)^{24} = (1,342.79)(2500) = 3,356,975$$



Temperatura medida de °C y °F determinada por la igualdad

$$9C - 5F + 160 = 0$$

Expresa en F °/f de C

$$5F = 9C + 160$$

$$F = \frac{9C + 160}{5}$$

$$F = \frac{9}{5}C + 32 \rightarrow F(C)$$

Expresa en C °/f de F

$$9C = 5F + 160$$

$$C = \frac{5F - 160}{9} \rightarrow C(F)$$

∴ 38 °C

$$5F = 9(38) + 160$$

$$5F = 342 + 160$$

$$F = \frac{342 + 160}{5}$$

$$F = \frac{342}{5} + 32$$

$$F = 68.4 + 32$$

$$F = 100.4\ °F$$

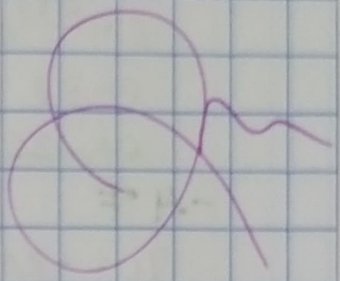
-COMPROBACIÓN

$$C = \frac{5(100.4) - 160}{9}$$

$$C = \frac{502 - 160}{9}$$

$$C = \frac{342}{9} = 38\ °C$$

Convierte de °C a °F ó °F a °C según corresponda y comprueba



- 20° C

$5F = 9(20) + 160$

$9F = 180 + 160$

$F = \frac{180 + 160}{5}$

$F = 36 + 32$

$F = 68°F$

COMPROBACIÓN

$9C = 5(68) - 160$

$9C = 340 - 160$

$C = \frac{340 - 160}{9}$

$C = 37.7 - 17.7$

$C = 20°C$

- 104° F

$9C = 5(104) + 160$

$9C = \frac{520 - 160}{9}$

$9C = 57.7 - 17.7$

$C = 40°C$

COMPROBACIÓN

$5F = 9(40) + 160$

$5F = 360 + 160$

$F = \frac{360 + 160}{5}$

$F = 70 + 32 = 102°F$

- 140° F

$9C = 700 - 160$

$C = \frac{700 - 160}{9}$

$C = 77.7 - 17.7$

$C = 60°C$

COMPROBACIÓN

$5F = 540 + 160$

$F = \frac{540 + 160}{5}$

$F = 108 + 32 = 140°F.$

- 37.2 °C

$5F = 334.8 + 160$

$F = \frac{334.8 + 160}{5}$

$F = 66.96 + 32$

$F = 98.96°F$

COMPROBACIÓN

$9C = 494.8 - 160$

$9C = \frac{494.8 - 160}{9}$

$C = 54.9 - 17.7 = 37.2°C$

- 35.5 °C

$5F = 319.8 + 160$

$F = \frac{319.8 + 160}{5}$

$F = 63.9 + 32$

$F = 95.9°F$

COMPROBACIÓN

$9C = 479.5 - 160$

$C = \frac{479.5 - 160}{9}$

$C = 53.2 - 17.7 \quad C = 35.5°C$

-95°F

$9C = 475 - 160$

$C = \frac{475 - 160}{9}$

$C = 52.7 - 17.7$

$C = 35\,°C$

COMPROVACIÓN

$5F = 315 + 160$

$F = \frac{315 + 160}{5}$

$F = 63 + 32 = 95\,°F$

-4°F

$9C = +20 - 160$

$C = \frac{-20 - 160}{9}$

$C = -2.2 + 17.7$

$C = -19.9\,°C$

COMPROVACIÓN

$5F = -36 + 160$

$F = \frac{-36 + 160}{5}$

$F = -7.2 + 32 = 24.8\,°F$

-5°C

$5F = 45 + 160$

$F = \frac{45 + 160}{5}$

$F = 9 + 32$

$F = 23\,°F$

COMPROVACIÓN

$9C = 115 - 160$

$C = \frac{115 - 160}{9}$

$C = 12.7 - 17.7 = -5\,°C$