

INSTITUTO TECNOLÓGICO  
SUPERIOR DE SAN ANDRÉS TUXTLA

INGENIERÍA EN GESTIÓN EMPRESARIAL

ASIGNATURA: CÁLCULO DIFERENCIAL

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"EJERCICIOS"

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Demstrar la propiedad conmutativa

$$\sqrt{x} \cdot \sqrt{x^3} \quad x^{\frac{1}{2}} \cdot x^{\frac{3}{2}} = x^{\frac{1}{2} + \frac{3}{2}} = x^2 = \sqrt{x^4}$$

$$x^{\frac{3}{2}} \cdot x^{\frac{1}{2}} = x^{\frac{3}{2} + \frac{1}{2}} = x^2 = \sqrt{x^4}$$

Demstrar la asociativa

$$\frac{1}{2} + \frac{3}{5} + \frac{2}{3} \quad \left(\frac{1}{2} + \frac{3}{5}\right) + \frac{2}{3} = \frac{33}{30} + \frac{20}{30} = \frac{53}{30} \quad \frac{1}{2} + \left(\frac{3}{5} + \frac{2}{3}\right) = \frac{15}{30} + \frac{38}{30} = \frac{53}{30}$$

$$\frac{1}{4} + \frac{1}{2} + \frac{3}{2} \quad \left(\frac{1}{4} + \frac{1}{2}\right) + \frac{3}{2} = \frac{12}{16} + \frac{24}{16} = \frac{36}{16} \quad \frac{1}{4} + \left(\frac{1}{2} + \frac{3}{2}\right) = \frac{4}{16} + \frac{32}{16} = \frac{36}{16}$$

Demstrar la propiedad distributiva

$$\begin{array}{l} 4(5+3) \\ 4(8) \\ 32 \end{array} \quad \begin{array}{l} 4(5) + 4(3) \\ 20 + 12 \\ 32 \end{array}$$

$$\left(\frac{3}{2} + \frac{1}{2}\right) 5$$

$$\frac{6}{4} + \frac{2}{4} = \frac{8}{4} = 2 \quad 5\left(\frac{3}{2} + \frac{1}{2}\right) = \frac{15}{2} + \frac{5}{2} = \frac{20}{2} = 10$$

Ejercicios Demstrar la distributiva Fecha → 21 / 9 / 22

$$3a(x^2 + ab)$$

$$(3a \cdot x^2) + (3a \cdot ab) = 3ax^2 + 3a^2b$$

$$(x^2 + y^2) 2a = (2a \cdot x^2) + (2a \cdot y^2) = 2ax^2 + 2ay^2$$

$$5(2+3)$$

$$(5 \cdot 2) + (5 \cdot 3) = 10 + 15$$

$$a(a^2 + b^2)$$

$$(a \cdot a^2) + (a \cdot b^2) = a^3 + ab^2$$

Demstrar la propiedad conmutativa

$$4\frac{1}{2} + 1\frac{6}{7}$$

$$1\frac{6}{7} + 4\frac{1}{2}$$

$$\frac{9}{2} + \frac{13}{7} = \frac{63}{14} + \frac{26}{14} = \frac{89}{14}$$

$$\frac{13}{7} + \frac{9}{2} = \frac{26}{14} + \frac{63}{14} = \frac{89}{14}$$



$$3\frac{1}{3} + 2\frac{3}{6}$$

$$\frac{10}{3} + \frac{15}{6} = \frac{20+15}{6} = \frac{35}{6}$$

$$2\frac{3}{6} + 3\frac{1}{3}$$

$$\frac{15}{6} + \frac{10}{3} = \frac{15+20}{6} = \frac{35}{6}$$

$$\frac{1}{y} \cdot \frac{y^2}{y^3} = \frac{y^2}{y^4}$$

$$\frac{y^2}{y^3} \cdot \frac{1}{y} = \frac{y^2}{y^4}$$

Demstrar la propiedad Asociativa

$$2\frac{3}{4} + 4 + 2\frac{4}{5}$$

$$\left(\frac{11}{4} + \frac{16}{4}\right) + \frac{14}{5} = \frac{27}{4} + \frac{14}{5} = \frac{135+56}{20} = \frac{191}{20}$$

$$\frac{11}{4} + \left(\frac{16}{4} + \frac{14}{5}\right) = \frac{11}{4} + \frac{80+56}{20} = \frac{11}{4} + \frac{136}{20} = \frac{544+220}{80} = \frac{764}{80} = \frac{191}{20}$$

$$3 + 2\frac{6}{7} + 5 \rightarrow 3 + \frac{20}{7} + \frac{5}{1}$$

$$\left(\frac{3}{1} + \frac{20}{7}\right) + \frac{5}{1} = \frac{21+20}{7} + \frac{5}{1} = \frac{41}{7} + \frac{5}{1} = \frac{41+35}{7} = \frac{76}{7}$$

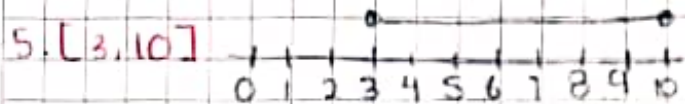
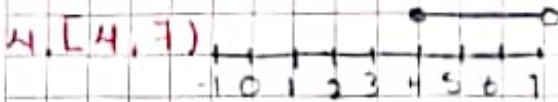
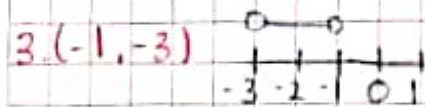
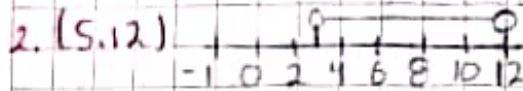
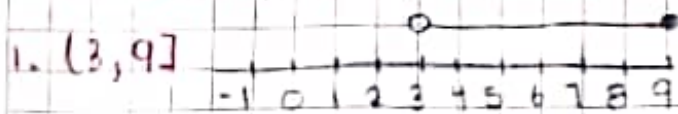
$$\frac{3}{1} + \left(\frac{20}{7} + \frac{5}{1}\right) = \frac{3}{1} + \frac{20+35}{7} = \frac{3}{1} + \frac{55}{7} = \frac{21+55}{7} = \frac{76}{7}$$

$$\frac{3}{2} + \frac{1}{5} + \frac{1}{2} = \left(\frac{3}{2} + \frac{1}{5}\right) + \frac{1}{2} = \frac{15+2}{10} + \frac{1}{2} = \frac{17}{10} + \frac{1}{2} = \frac{34+10}{20} = \frac{44}{20} = \frac{11}{5}$$

$$\frac{3}{2} + \left(\frac{1}{5} + \frac{1}{2}\right) = \frac{3}{2} + \frac{2+5}{10} = \frac{3}{2} + \frac{7}{10} = \frac{14+7}{20} = \frac{21}{20} = \frac{11}{5}$$

Represente en línea

1.  $(3, 9]$  2.  $(5, 12)$  3.  $(-1, -3)$  4.  $[4, 7)$  5.  $[3, 10]$



Represente símbolo y gráfica mayor menor

$$\{x \in \mathbb{R} \mid -5 < x \leq 3\}$$

A number line from -5 to 4. An open circle is at -5 and a closed circle is at 3. A horizontal line segment connects them.

$(-5, 3]$

$$\{x \in \mathbb{R} \mid 0 < x \leq 8\}$$

A number line from 0 to 9. An open circle is at 0 and a closed circle is at 8. A horizontal line segment connects them.

$(0, 8]$

$$\{x \in \mathbb{R} \mid x \leq 9\}$$

A number line from -∞ to 9. A closed circle is at 9. An arrow points to the left from the circle.

$(-\infty, 9]$

$$\{x \in \mathbb{R} \mid x < 15\}$$

A number line from -∞ to 15. An open circle is at 15. An arrow points to the left from the circle.

$(-\infty, 15)$



# Calculo diferencial

Expresen en Intervalo

Resolver

22 / 9 / 22

$\leftarrow (-\infty, 0]$	$2^3 = 8$	$(u+t)^2 = \frac{1}{(u+t)^2}$
$(0, 6]$	$5^0 = 1$	$\frac{a^3}{ab} = \frac{a^2}{b}$
$(-2, 8)$	$a^{-3} \cdot a^5 = a^2$	$\left(\frac{5}{6}\right)^{-3} = \frac{1}{\left(\frac{5}{6}\right)^3}$
$(3, 8)$	$\sqrt[3]{ab} = a^{\frac{1}{3}} \cdot b^{\frac{1}{3}} = (ab)^{\frac{1}{3}}$	
	$\sqrt[3]{\frac{x}{2}} = \left(\frac{x}{2}\right)^{\frac{1}{3}}$	
	$a^{\frac{1}{2}} \cdot a^{\frac{5}{4}} = a^{\frac{1}{2} + \frac{5}{4}} = a^{\frac{2+5}{4}} = a^{\frac{7}{4}} = \sqrt[4]{a^7}$	

## Ejercicios

Fecha  $\rightarrow$  23/9/22

Resolver lo siguiente:

$$\sqrt{\frac{x^2}{x^{\frac{1}{3}}}} = \sqrt{x^{\frac{5}{3}}} = \left(x^{\frac{5}{3}}\right)^{\frac{1}{2}} = x^{\frac{5}{6}} = \sqrt[6]{x^5}$$

$$\frac{ab}{a^3bx} = a^2x$$

$$\frac{\sqrt{x}}{\sqrt{x}\sqrt{y^3}} = \sqrt{y^3} = y^{\frac{3}{2}}$$

$$\frac{x^{-1}}{x^2 \cdot y^3} = \frac{1}{x^3 y^3}$$

$$\frac{z^3bc}{ac^3b^{-2}} = \frac{z^3b^3c}{ac^3} = \frac{z^3b^3}{ac^2}$$

$$\downarrow$$

$$\frac{b^3z^3}{ac^2}$$