Ecuaciones e inecuaciones

1. ⓐ $\left(\frac{2}{3}\right)\left(\frac{3}{4}\right)^2\left(\frac{4}{5}\right)^3 = \left(\frac{2}{3}\right)\left(\frac{3^2}{4^2}\right)\left(\frac{4^3}{5^3}\right) = \frac{2.3.4}{5^3}$

ⓔ $\left(\frac{3}{4}\right)^2\left(\frac{5}{4}\right)^{-3} = \left(\frac{3^2}{4^2}\right)\left(\frac{4^3}{5^3}\right) = \frac{3^2.4}{5^3}$

ⓙ $\left(\frac{1}{2}+\frac{1}{3}\right)4 - \frac{4}{3} = \left(\frac{1.3+2.1}{2.3}\right)4 - \frac{4}{3} = \frac{5.2}{3} - \frac{4}{3} = \frac{6}{3} = 2$

2. ⓐ $\left|\frac{1}{3}-\frac{2}{5}\right| + \left|-\frac{1}{3}+\frac{2}{5}\right| = \left|\frac{5-6}{3.5}\right| + \left|\frac{-5+6}{3.5}\right|$

$\left|\frac{-1}{15}\right| + \left|\frac{1}{15}\right| = \frac{1}{15} + \frac{1}{15} = \frac{2}{15}$

ⓔ $\frac{3!}{5} + \frac{5}{3!} = \frac{6}{5} + \frac{5}{6} = \frac{36+25}{30} = \frac{61}{30}$ ($3! = 3.2.1$)

3. ⓑ $\sum_{K=1}^{5} k^2 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 = 55$

ⓖ $\prod_{k=1}^{5} \frac{K+1}{K} = \left(\frac{1+1}{1}\right)\left(\frac{2+1}{2}\right)\left(\frac{3+1}{3}\right)\left(\frac{4+1}{4}\right)\left(\frac{5+1}{5}\right) = \frac{2}{1}\cdot\frac{3}{2}\cdot\frac{4}{3}\cdot\frac{5}{4}\cdot\frac{6}{5} = 6$

ⓗ $\sum_{i=1}^{4}\left(\sum_{K=1}^{i} 2(K+1)\right) = \sum_{K=1}^{1} 2(K+1) + \sum_{K=1}^{2} 2(K+1) +$

$\sum_{K=1}^{3} 2(K+1) + \sum_{K=1}^{4} 2(K+1) = 2.5.1 + 2.4.2 + 2.3.3 + 2.2.4 = 10 + 16 + 18 + 16 = 60$

$2(1+1) + 2(1+2) + 2(1+3) + 2(1+4)$

Polinomios

$\frac{-b \pm \sqrt{b^2-4ac}}{2a}$

1. ⓐ $p(x) = x^2 - 3x + 2 = 0$

$x = \frac{3 \pm \sqrt{(-3)^2 - 4.2}}{2} = \frac{3 \pm \sqrt{1}}{2} = \begin{cases} 2 \\ 1 \end{cases}$ $\quad p(x) = (x-2)(x-1) = x^2 - 3x + 2$ (desarrollo / factorizo)

raiz existente 1 – sumatoria de los coef. = 0

" -1 – sumatoria de los coef. de grado par es igual a los de grado impar

" 0 – no tiene termino independiente

	1	-3	2
1		1	-2
	1	-2	0

$(x-2) = 0 \rightarrow x = 2$

2. ⓒ $p(x) = x^3 - x^2 - 4x + 4 = 0$

	1	-1	-4	4
1		1	0	-4
	1	0	-4	0

raiz 1

$(x-1)(x^2-4) = 0$

$x = 1$ $\quad x^2 - 4 = 0$

$x^2 = 4 \rightarrow x = \pm\sqrt{4}$

$x = 2, x = -2$

$x^2 + 0x - 4 = 0$

$x^2 - 4 = 0$

$x^2 = 4$

$x = \pm\sqrt{4} = \pm 2$

Geometria

1. Det. la ec. de una recta a partir de dos puntos

$y = mx + n$ $\quad m = \frac{y_1 - y_0}{x_1 - x_0}$

$y - y_1 = m(x - x_1)$

ⓐ $(1,4), (4,1) \rightarrow m = \frac{1-4}{4-1} = \frac{-3}{3} = -1$

$y - 1 = -1(x - 4) \rightarrow y = -x + 4 + 1 \rightarrow y = -x + 5$

2. Det. centro y radio de una c/a.

$(x - c_1)^2 + (y - c_2)^2 = r^2$ $\quad$ Centro $c = (c_1, c_2)$ $\quad$ Radio $r = \sqrt{r^2}$

ⓐ $3x^2 + 3y^2 - 18y + 18 = 0 \rightarrow x^2 + y^2 - 6y + 6 = 0 \rightarrow x^2 + y^2 - 6y + 9 - 9 + 6 = 0$

$(y-3)^2$

$(x - c_1)^2 + (y - c_2)^2 = r^2$

$x^2 \rightarrow (x - c_1)^2 = x^2 - 2c_1x + c_1^2 = x^2 \rightarrow c_1 = 0$

$y^2 - 6y \rightarrow (y - c_2)^2 = y^2 - 2c_2y + c_2^2$ $\quad -2c_2y = -2.3.y$ $\quad c_2 = 3$

6

$(y-3)^2 = y^2 - 6y + 9$

$(x-0)^2 + (y-3)^2 - 9 + 6 = 0$

$(x-0)^2 + (y-3)^2 = 3$

$c = (0,3)$

$r = \sqrt{3}$