RETTE , SIMMETRIE ASSIALI , MODULO DI UN PUNTO

Definizioni

punto medio

$$\text{medio}(\mathfrak{p}, \mathfrak{q}) = \frac{\mathfrak{p} + \mathfrak{q}}{2}$$

linea congiungente due punti

$$\text{linea}(\mathfrak{p}, \mathfrak{q}, \mathfrak{t}) = \mathfrak{p} + \mathfrak{t}(\mathfrak{q} - \mathfrak{p})$$

equazioni di rette

Upon [Simplify] transform $\mathfrak{r} = \text{EquazioneRettaPerDuePunti}(\mathfrak{p}, \mathfrak{q})$ into $\frac{y - \mathfrak{p}_2}{\mathfrak{q}_2 - \mathfrak{p}_2} = \frac{x - \mathfrak{p}_1}{\mathfrak{q}_1 - \mathfrak{p}_1}$.

Upon [Simplify] transform $\mathfrak{r} = \text{EquazioniRettePerUnPunto}(\mathfrak{p})$ into $y - \mathfrak{p}_2 = \text{pendenza}(x - \mathfrak{p}_1)$

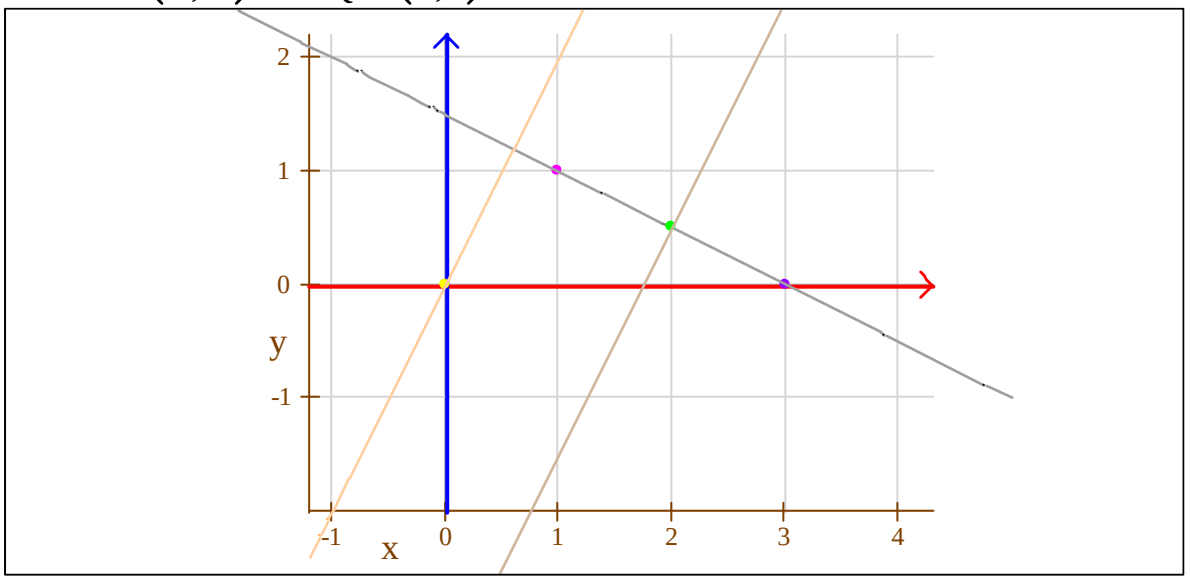
modulo di un punto

Upon [Transform] transform $|\mathfrak{p}|$ into $\sqrt{\mathfrak{p}_1^{\,2} + \mathfrak{p}_2^{\,2}}$.

dati

$a = 1 \qquad b = 1 \qquad r = 3$ **modifica i valori di questi dati**

$P = (a, b) \qquad Q = (r, 0)$



elaborazioni

punto medio

$M = \text{medio}(P, Q)$

$M = \frac{1}{2}([r, 0] + [a, b])$ Substitute

$M = \left(\frac{1}{2}[r + a], \frac{1}{2}b\right)$ Expand

retta s per P e Q

$EQs = \text{EquazioneRettaPerDuePunti}(P, Q)$

$EQs = \text{EquazioneRettaPerDuePunti}([a, b], [r, 0])$ Substitute

$-\frac{y - b}{b} = \frac{x - a}{r - a}$ Simplify

$y = -\frac{b(x - a)}{r - a} + b$ Isolate

$y = -\frac{1(x - 1)}{r - 1} + 1$ Calculate Calculate Calculate Calculate

$$y = -\frac{x-1}{r-1}+1 \quad \text{Simplify}$$

$$QUOTAs = \left[y \right]_{x=0}$$

$$QUOTAs = \frac{a\,b}{r-a}+b \quad \text{Substitute}$$

$$QUOTAs = \frac{1\cdot 1}{r-1}+1 \quad \text{Calculate Calculate Calculate Calculate}$$

$$QUOTAs = \frac{1}{r-1}+1 \quad \text{Simplify}$$

$$PENDENZAs = \left[y \right]_{x=1} - \left[y \right]_{x=0}$$

$$PENDENZAs = -\frac{(-a+1)\,b}{r-a} - \frac{a\,b}{r-a} \quad \text{Substitute}$$

$$PENDENZAs = -\frac{b}{r-a} \quad \text{Collect}$$

$$PENDENZAs = -\frac{1}{r-1} \quad \text{Calculate Calculate}$$

retta s' perpendicolare a s e passante per l'origine

$$PENDENZAs\ PENDENZAs' = -1$$

$$PENDENZAs' = -\frac{1}{PENDENZAs} \quad \text{Isolate}$$

$$PENDENZAs' = \frac{r-a}{b} \quad \text{Substitute}$$

$$PENDENZAs' = \frac{r-1}{1} \quad \text{Calculate Calculate}$$

$$PENDENZAs' = r-1 \quad \text{Simplify}$$

retta s'' perpendicolare a s e passante per M

$$EQs'' = EquazioniRettePerUnPunto(M)$$

$$-M_2 + y = (-M_1 + x)\,pendenza \quad \text{Simplify}$$

$$pendenza = PENDENZAs'$$

$$-M_2 + y = (-M_1 + x)\,PENDENZAs' \quad \text{Substitute}$$

$$y = M_2 + (-M_1 + x)\,PENDENZAs' \quad \text{Isolate}$$

$$y = \left(-\tfrac{1}{2}[r+a] + x\right) PENDENZAs' + \tfrac{1}{2}b \quad \text{Substitute}$$

$$y = \frac{(r-a)\left(-\tfrac{1}{2}[r+a] + x\right)}{b} + \tfrac{1}{2}b \quad \text{Substitute}$$

$$y = \frac{(r-1)\left(-\tfrac{1}{2}[r+1] + x\right)}{1} + \tfrac{1}{2}\cdot 1 \quad \text{Calculate Calculate Calculate Calculate}$$

$$y = (r-1)\left(-\tfrac{1}{2}[r+1] + x\right) + \tfrac{1}{2} \quad \text{Simplify}$$

$$y = -\tfrac{1}{2}r^2 + r\,x - x + 1 \quad \text{Expand}$$

$$QUOTAs'' = \left[y \right]_{x=0}$$

$$QUOTAs'' = -\tfrac{1}{2}\frac{(r+a)(r-a)}{b} + \tfrac{1}{2}b \quad \text{Substitute}$$

$$QUOTAs'' = -\tfrac{1}{2}\frac{r^2-a^2}{b} + \tfrac{1}{2}b \quad \text{Expand}$$

$$\text{QUOTAs}'' = \frac{1}{2}\frac{-r^2+a^2+b^2}{b}$$ Collect

$$\text{QUOTAs}'' = \frac{1}{2}\frac{-r^2+1^2+1^2}{1}$$ Calculate Calculate Calculate

$$\text{QUOTAs}'' = \frac{1}{2}\left(-r^2+2\right)$$ Simplify

$$\text{QUOTAs}'' = -\frac{1}{2}r^2+1$$ Expand

$$\text{QUOTAs}'' = 0$$

$$\frac{1}{2}\frac{-r^2+a^2+b^2}{b} = 0$$ Substitute

$$r^2 = a^2+b^2$$ Isolate

$$r = \sqrt{a^2+b^2}$$ Isolate

$$m = r$$

$$m = \sqrt{a^2+b^2}$$ Substitute

$$r^2 = 1^2+1^2$$ Calculate Calculate

$$r^2 = 2$$ Simplify

$$r = \sqrt{2}$$ Isolate