

Plus De
Bonnes
Notes

Rappels: $d: 2x + 3y + 5 = 0.$

$$a = 2 \quad b = 3 \quad c = 5.$$

Vecteur directeur: $\vec{u} \begin{pmatrix} -b \\ a \end{pmatrix} = \vec{u} \begin{pmatrix} -3 \\ 2 \end{pmatrix}.$

Application:

1) Soient (d) une droite d'équation $y = 2x + 3$. Déterminer l'équation réduite de la droite (d') parallèle à (d) passant par $A(2; 3)$.

2) Déterminer les coordonnées du point d'intersection I des droites (d) et (d'') : $y = -\frac{3}{2}x + \frac{9}{4}$.

1) (d') est parallèle à (d) , elles ont donc le même coefficient directeur:

$$y = 2x + p.$$

Or on sait que $A \in (d')$.

$$3 = 2 \times 2 + p.$$

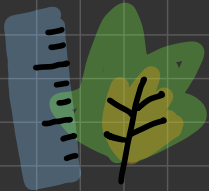
$$3 = 4 + p.$$

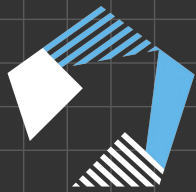
$$p = 3 - 4$$

$$p = -1.$$

$$(d'): \boxed{y = 2x - 1.}$$

2) On cherche l'intersection de (d) et (d'') :
$$\begin{cases} y = 2x + 3 \\ y = -\frac{3}{2}x + \frac{9}{4} \end{cases}$$





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$$\begin{cases} -\frac{3}{2}x + \frac{9}{4} = 2x + 3 \\ y = -\frac{3}{2}x + \frac{9}{4} \end{cases}$$

$$\begin{cases} -\frac{3}{2}x - \frac{2x \times 2}{1 \times 2} = -\frac{9}{4} + \frac{3 \times 4}{1 \times 4} \\ y = -\frac{3}{2}x + \frac{9}{4} \end{cases}$$

$$\begin{cases} -\frac{3}{2}x - \frac{4x}{2} = -\frac{9}{4} + \frac{12}{4} \\ y = -\frac{3}{2}x + \frac{9}{4} \end{cases}$$

$$\begin{cases} -\frac{7}{2}x = \frac{3}{4} \\ y = -\frac{3}{2}x + \frac{9}{4} \end{cases}$$

$$\begin{cases} x = \frac{\frac{3}{4}}{-\frac{7}{2}} = \frac{3}{4} \times \frac{-2}{7} = \frac{-3}{14} \\ y = -\frac{3}{2}x + \frac{9}{4} = \frac{9}{28} + \frac{9 \times 7}{4 \times 7} \end{cases}$$

$$\begin{cases} x = \frac{-3}{14} \\ y = -\frac{3}{2} \times \left(\frac{-3}{14} \right) + \frac{9}{4} = \frac{9}{28} + \frac{9 \times 7}{4 \times 7} \end{cases}$$

$$\begin{cases} x = \frac{-3}{14} \\ y = \frac{9}{28} + \frac{63}{28} = \frac{72}{28} = \frac{2 \times 36}{2 \times 14} = \frac{2 \times 18}{2 \times 7} = \frac{18}{7} \end{cases}$$

$$S = \left\{ \left(\frac{-3}{14}, \frac{18}{7} \right) \right\}$$

$$x = \frac{-3}{14}$$

$$y = \frac{18}{7}$$

Application:

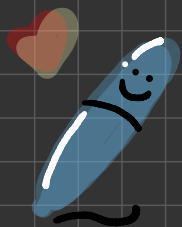
$$(S): \begin{cases} (2x - 3y = 5) \times 3 \\ (3x + 4y = -3) \times 2 \end{cases} \quad \delta = 2 \times 4 - (-3) \times 3 = 8 + 9 = 17 \neq 0$$

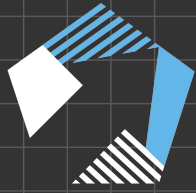
(S) admet une solution unique.

$$(S): \begin{cases} 6x - 9y = 15 \\ 6x + 8y = -6 \end{cases} \quad \begin{matrix} A = B \\ C = D \end{matrix}$$

$$A - C = B - D$$

$$-9y - 8y = 15 - (-6)$$





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$$-17y = 21.$$

$$y = \frac{-21}{17}$$

$$2x - 3x \left(\frac{-21}{17} \right) = 5.$$

$$2x + \frac{63}{17} = 5$$

$$2x = \frac{17 \times 5}{17 \times 1} - \frac{63}{17}$$

$$2x = \frac{22}{17}$$

$$x = \frac{22}{17} \times \frac{1}{2} = \frac{11}{17}$$

$$2x = 4$$

$$x = 2$$

$$S = \{2\}$$

$$S = \left\{ \left(\frac{11}{17}; \frac{-21}{17} \right) \right\}$$

Exercice 1:

$$\begin{cases} (5x - 3y = 26) \times 3 \\ (3x + 4y = 33) \times 5 \end{cases}$$

$$1. \Delta = 5 \times 4 - (-3) \times 3 = 20 + 9 = 29 \neq 0.$$

$$2. \begin{cases} 15x - 9y = 78 \\ 15x + 20y = 165 \end{cases}$$

$$-9y - 20y = 78 - 165$$

$$-29y = -87$$

$$y = \frac{-87}{-29}$$

$$y = 3.$$

$$5x - 3 \times 3 = 26$$

$$5x - 9 = 26.$$

$$5x = 35$$

$$x = \frac{35}{5} = 7.$$

$$S = \{(7; 3)\}.$$

EX02:

$$1) \begin{cases} x - 4y = -2 \\ x + y = 3 \end{cases}$$

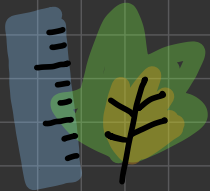
$$-5y = -5$$

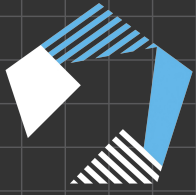
$$y = 1$$

$$x + 1 = 3$$

$$x = 2$$

$$S = \{(2; 1)\}.$$





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$$2) \begin{cases} x-y=4 \\ 2x+3y=3 \end{cases} \Leftrightarrow \begin{cases} x=y+4 \\ 2(y+4)+3y=3 \end{cases}$$

$$\Leftrightarrow \begin{cases} x=y+4 \\ 2y+8+3y=3 \end{cases}$$

$$\Leftrightarrow \begin{cases} x=y+4 \\ 5y=-5 \end{cases}$$

$$\Leftrightarrow \begin{cases} x=-1+4=3 \\ y=-1 \end{cases} \quad \mathcal{S} = \left\{ (3; -1) \right\}$$

$$3) \begin{cases} (4x+9y=5) \times 3 \\ (6x-6y=1) \times 2 \end{cases}$$

$$\begin{cases} 12x+27y=15 \\ 12x-12y=2 \end{cases}$$

$$27y - (-12y) = 13$$

$$39y = 13$$

$$y = \frac{13}{39} = \frac{13}{13 \times 3} = \boxed{\frac{1}{3}}$$

$$4x + 9 \times \frac{1}{3} = 5$$

$$4x + 3 = 5$$

$$x = \frac{5-3}{4}$$

$$x = \boxed{\frac{1}{2}}$$

$$\mathcal{S} = \left\{ \left(\frac{1}{2}; \frac{1}{3} \right) \right\}$$

$$4) \begin{cases} (2x+3y=1) \times 2 \\ (5x-2y=12) \times 3 \end{cases}$$

$$\begin{cases} 4x+6y=2 \\ 15x-6y=36 \end{cases}$$

$$19x = 38$$

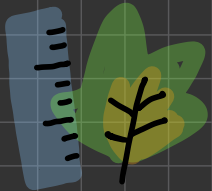
$$x = \boxed{2}$$

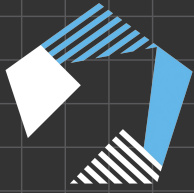
$$2 \times 2 + 3y = 1$$

$$3y = -3$$

$$y = \boxed{-1}$$

$$\mathcal{S} = \left\{ (2; -1) \right\}$$





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$$5) \begin{cases} (2x - 6y = 5) \times 3 \\ (3x - 9y = 1) \times 2 \end{cases}$$

$$\begin{cases} 6x - 18y = 15 \\ 6x - 18y = 2 \end{cases}$$

$$0 = 13$$

$$S = 2x(-9)$$

$$S = \emptyset.$$



$$6) \begin{cases} \frac{2}{x} + \frac{1}{y} = 1 \\ \frac{3}{x} + \frac{2}{y} = 2 \end{cases}$$

$$x \neq 0 \text{ et } y \neq 0.$$

$$X = \frac{1}{x} \quad Y = \frac{1}{y}$$

$$\begin{cases} 2X + Y = 1 \\ 3X + 2Y = 2 \end{cases}$$

$$X = 0$$

$$\frac{1}{x} = 0$$

$$\begin{cases} Y = 1 - 2X \\ 3X + 2(1 - 2X) = 2 \end{cases}$$

$$\begin{cases} Y = 1 - 2X \\ -X = 0 \end{cases}$$

