

## Example #1

$$a) \quad \begin{array}{r} x - 8 = 4 \Rightarrow x = 12 \\ +8 \quad +8 \end{array}$$

$$b) \quad \begin{array}{r} x + 2 = -11 \Rightarrow x = -13 \\ -2 \quad -2 \end{array}$$

$$c) \quad \begin{array}{r} 2x - 4 = x + 5 \Rightarrow 2x = x + 9 \Rightarrow x = 9 \\ +4 \quad +4 \quad -x \quad -x \end{array}$$

## Example #2

$$a) \quad \frac{3x}{3} = \frac{4}{3} \Rightarrow x = \frac{4}{3} \Rightarrow x = 1\frac{1}{3}$$

$$b) \quad \begin{array}{r} \frac{x}{2} = 11 \Rightarrow x = 22 \\ \times 2 \quad \times 2 \end{array}$$

$$\begin{aligned} 2x - 1 &= -(5x + 4) + 3 \Rightarrow 2x - 1 = -5x - 4 + 3 \Rightarrow 2x - 1 = -5x - 1 \\ &\quad +1 \quad +1 \\ \Rightarrow 2x &= -5x + 0 \Rightarrow \frac{7x}{7} = \frac{0}{7} \Rightarrow x = 0 \\ &\quad +5x \quad +5x \end{aligned}$$

$$\begin{aligned} 2x - 5 &= 2(x - 3) + 1 \Rightarrow 2x - 5 = 2x - 6 + 1 \Rightarrow 2x - 5 = 2x - 5 \Rightarrow \\ \frac{2x}{2} &= \frac{2x}{2} \Rightarrow x = x \\ &\quad +5 \quad +5 \end{aligned}$$

$$\begin{array}{r} \frac{x+5}{2} - \frac{4}{1 \cdot 2} = \frac{2x-1}{3} \Rightarrow \frac{x+5-8}{\cancel{x2} \cdot 3} = \frac{2x-1}{\cancel{3} \cdot 2} \Rightarrow 3(x+5-8) = 2(2x-1) \end{array}$$

$$3(x-3) = 2(2x-1) \Rightarrow \begin{array}{r} 3x - 9 = 4x - 2 \Rightarrow 3x = 4x + 7 \Rightarrow -x = 7 \Rightarrow \\ +9 \quad +9 \quad -4x \quad -4x \quad -1 \quad -1 \end{array}$$

$$x = -7$$

# Problème narratif

exemple #1

$$2n + 2n + 2 + 2n + 4 = 90$$

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$$6n + 6 = 90$$

$$-6 \quad -6$$

$$6n = 84$$

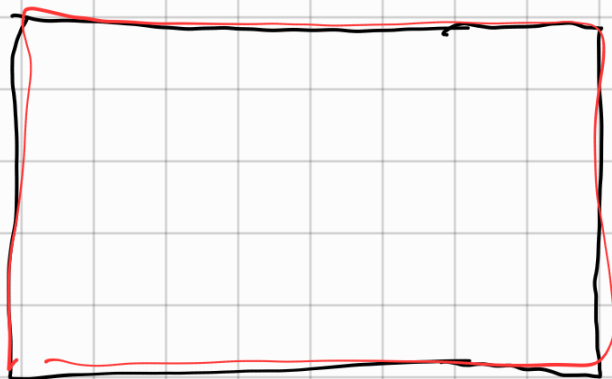
$$\frac{6n}{6} = \frac{84}{6}$$

$$n = 14$$

$$2n = 28$$

$$2n + 2 = 30$$

$$2n + 4 = 32$$



$$l = x$$

$$p = 62$$

$$L = x + 8$$

$$2(x + 8) + 2(x) = 62$$

↓

$$2x + 16 + 2x = 62$$

↓

$$4x + 16 = 62$$

$$-16 \quad -16$$

↓

$$\frac{4x}{4} = \frac{46}{4}$$

$$x = 11,5$$

$$\text{longueur} = 11,5$$

$$\text{Largeur} = 11,5 + 8 = 19,5$$

## Inéquation linéaire

$$3) \begin{array}{ccccccc} x-2 & \geq & 3x+7 & \Rightarrow & x & \geq & 3x+9 \\ +2 & & +2 & & -3x & & -3x \end{array} \Rightarrow \frac{-2x}{-2} \geq \frac{9}{-2}$$
$$x \leq -4,5$$

$$\left] -\infty, -\frac{9}{2} \right]$$

$$2) \begin{array}{ccccccc} 4x+3 & > & x+1 & \Rightarrow & 4x & > & x-2 \\ -3 & & -3 & & -x & & -x \end{array} \Rightarrow \frac{3x}{3} > \frac{-2}{3}$$
$$x > -\frac{2}{3}$$

## Inéquations composées

$$2) \begin{array}{ccccccc} -2 & \leq & -3x+7 & < & 10 & \Rightarrow & -9 & \leq & \frac{-3x}{-3} & < & \frac{3}{-3} \\ -7 & & -7 & & -7 & & -3 & & -3 & & -3 \end{array}$$

$$-3 \geq x > -1$$

$$\left] -1, -3 \right] \quad \Leftarrow \quad -1 < x \leq -3$$

$$1) \begin{array}{ccccccc} -1 & \leq & 2x-3 & < & 5 & \Rightarrow & \frac{2}{2} & \leq & \frac{2x}{2} & < & \frac{8}{2} & \Rightarrow & 1 & \leq & x & < & 4 \\ +3 & & +3 & & +3 & & & & & & & & & & & & & \end{array}$$

$$\left[ 1, 4 \right[$$

$$3) \begin{array}{ccccccc} -1 & \leq & 2x+3 & < & x+4 & \Rightarrow & -4 & \leq & \frac{2x}{-x} & < & \frac{x}{-x}+1 \\ -3 & & -3 & & -3 & & & & -x & & -x \end{array}$$

$$-4 \leq x < 1$$

$$\left[ -4, 1 \right[$$

$$4) \quad \begin{array}{r} 2 < x - 5 \\ +2 \quad +5 \\ \hline 7 < x \end{array}$$

$$x - 5 \leq -2x - 2$$

$$\begin{array}{r} +5 \quad +5 \\ \hline \end{array}$$

$$\begin{array}{r} x \leq -2x + 3 \\ +2x \quad +2x \\ \hline \end{array}$$

$$\frac{3x}{3} \leq \frac{3}{3}$$

$$x \leq 1$$

$$\underbrace{1 \geq x \geq 7}$$

impossible

$$g) |4x + 12| > 8$$

$$\begin{array}{r} 4x + 12 > 8 \\ -12 \quad -12 \\ \hline \end{array}$$

$$\frac{4x}{4} > \frac{-4}{4}$$

$$x = -1$$

$$\begin{array}{r} 4x + 12 < -8 \\ -12 \quad -12 \\ \hline \end{array}$$

$$\frac{4x}{4} < \frac{-20}{4}$$

$$x = -5$$

$$f) |2x - 3| = 5$$

$$2x - 3 = 5$$

$$\begin{array}{r} +3 \quad +3 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$x = 4$$

or

$$2x - 3 = -5$$

$$\begin{array}{r} +3 \quad +3 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{-2}{2}$$

$$x = -1$$

$$\{4, -1\}$$

$$c) |7 - x| < 4$$

$$\begin{array}{r} 7 - x < 4 \\ -7 \quad -7 \end{array}$$

$$\frac{-x}{-1} < \frac{-3}{-1}$$

$$x > 3$$

$$\begin{array}{r} 7 - x > -4 \\ -7 \quad -7 \end{array}$$

$$\frac{-x}{-1} > \frac{-11}{-1}$$

$$x < 11$$

$$3 < x < 11$$

$$]3, 11[$$

formule Quadratique

$$a) 4x^2 - 3x = 2 - 3x^2 + 2x$$

$$\begin{array}{r} \Downarrow \\ 4x^2 = 2 - 3x^2 + 5x \\ +3x^2 \quad +3x^2 \end{array}$$

$$\begin{array}{r} \Downarrow \\ 7x^2 = 2 + 5x \\ -2 \quad -5x \end{array}$$

$$\begin{array}{r} \Downarrow \\ 7x^2 - 5x - 2 = 0 \end{array}$$

Exemple

$$a) \boxed{1}x^2 + \boxed{1}x - \boxed{2} = 0$$

$\begin{matrix} a & b & c \end{matrix}$

$$3) \boxed{-1}x^2 + \boxed{2}x + \boxed{-3} = 0$$

$\quad \quad \quad a \quad \quad b \quad \quad c$

$$b^2 - 4 \cdot a \cdot c = 2^2 - 4 \cdot (-1) \cdot (-3) = -8 < 0$$

no real solution

$$2) \boxed{1}x^2 + \boxed{6}x + \boxed{9} = 0$$

$\quad \quad \quad a \quad \quad b \quad \quad c$

$$b^2 - 4 \cdot a \cdot c \Rightarrow 6^2 - 4 \cdot 1 \cdot 9 \Rightarrow 36 - 36 = 0$$

$$x = \frac{-b}{2a} \Rightarrow \boxed{x = -3}$$

$$x^2 = x$$

↓

$$x^2 - x = 0$$

$$x(x-1) = 0$$

$$x = 0 \quad \text{or} \quad x - 1 = 0$$

$$x = 0 \quad \text{or} \quad x = 1$$