



NAME :

Mark : /20

Class min/mean/max:

Parents signature :

3°IN Assessment n°4
Algebra and Equations

Ecole Internationale
Manosque
3°in

Duration : 60'

Exercise 1: (3pts) Expand and simplify

$$\frac{1}{3}(-9x + 21) =$$

$$(2x + 1)(x - 2) =$$

$$(7x + 3)(3x - 2) + 3x - 2 =$$

Exercise 2: (4pts) Factorise and simplify

$$-8x^2 + 4 =$$

$$18x + 9x^2 =$$

$$(x + 8)(x + 7) - (2x + 5)(x + 8) =$$

$$(7x + 3)(3x - 2) + 3x - 2 =$$

Exercise 3: (3pts)

Solve the following inequations and sketch up graphically the solutions on a line :

a. $2(x + 3) < -2x + 4$

b. $\frac{x}{2} > -\frac{2}{3}$

c. $\frac{x - 3}{2} \leq \frac{x + 2}{3}$

Exercise 4: (4pts) Solve the following equations

a. $2(x + 3) = -2x + 4$

b. $(x + 3)(x - 1) = 0$

c. $5x(x + 7) = 0$

d. $(x + 3)(3x - 2) = 3x - 2$

Exercise 5: (3pts) From brevet 2012

We consider the expression : $A = (2x + 1)(x - 5)$

1. Expand and simplify A.
2. Calculate A for $x = -3$.
3. Solve the equation $A = 0$.

Exercise 6: (3pts) From brevet 2012

To offer Anaëlle, who is leaving, a departure gift, the pupils of 3° IN have collected 500€ in notes of 20€ and 5€. All together, they have 43 notes.

Find the number of notes of each kind.

Even if your work is not finished, leave proves of your research. It will be taken into account in the mark.



**3°IN Assessment n°4
correction**

Exercise 1: (3pts) Expand and simplify

$$\frac{1}{3}(-9x + 21) = -3x + 7$$

$$(2x + 1)(x - 2) = 2x^2 + x - 4x - 2 = 2x^2 - 3x - 2$$

$$(7x + 3)(3x - 2) + 3x - 2 = 21x^2 + 9x - 14x - 6 + 3x - 2 = 21x^2 - 2x - 8$$

Exercise 2: (4pts) Factorise and simplify

$$-8x^2 + 4 = 4(-2x^2 + 1) \quad 18x + 9x^2 = 9x(2 + x)$$

$$(x + 8)(x + 7) - (2x + 5)(x + 8) = (x + 8)[(x + 7) - (2x + 5)] = (x + 8)[x + 7 - 2x - 5] = (x + 8)(-x + 2)$$

$$(7x + 3)(3x - 2) + 3x - 2 = (3x - 2)[(7x + 3) + 1] = (3x - 2)(7x + 4)$$

Exercise 3: (3pts)

$$\text{b. } 2(x + 3) < -2x + 4 \Leftrightarrow 2x + 6 < -2x + 4 \Leftrightarrow 4x < -2 \Leftrightarrow x < -\frac{1}{2} \quad \text{b. } \frac{x}{2} > -\frac{2}{3} \Leftrightarrow 3x > -4 \Leftrightarrow x > -\frac{4}{3}$$

$$\text{c. } \frac{x - 3}{2} \leq \frac{x + 2}{3} \Leftrightarrow 3(x - 3) \leq 2(x + 2) \Leftrightarrow 3x - 9 \leq 2x + 4 \Leftrightarrow x \leq -13$$

Exercise 4: (4pts) Solve the following equations

$$\text{b. } 2(x + 3) = -2x + 4 \Leftrightarrow x = -0.5 \text{ (see ex 2)} \quad \text{b. } (x + 3)(x - 1) = 0 \text{ This product is zero if and only if one of its factors is zero, so } x = -3 \text{ or } x = 1$$

$$\text{c. } 5x(x + 7) = 0 \text{ idem so } x = 0 \text{ or } x = -7 \quad \text{d.}$$

$$(x + 3)(3x - 2) = 3x - 2 \Leftrightarrow (3x - 2)(x + 3 - 1) = 0 \Leftrightarrow (3x - 2)(x + 2) = 0 \text{ This product is zero if and only if one of its factors is zero, so } x = 2/3 \text{ or } x = -2$$

Exercise 5: (3pts) From brevet 2012

We consider the expression : $A = (2x + 1)(x - 5)$

$$4. \text{ Expand and simplify A. } A = (2x + 1)(x - 5) = 2x^2 + x - 10x - 5 = 2x^2 - 9x - 5$$

$$5. \text{ Calculate A for } x = -3. A = (-6 + 1)(-3 - 5) = -5 \times -8 = 40$$

$$6. \text{ Solve the equation } A = 0. \text{ This product is zero if and only if one of its factors is zero, so } x = -0.5 \text{ or } x = 5$$

Exercise 6: (3pts) From brevet 2012

Let's denote x the number of 20€ notes and y the number of 5 € notes. We thus have $x + y = 43$ or

$$x = 43 - y. \text{ We have though } 500 = \underbrace{20(43 - y)}_{\text{amount in 20€}} + \underbrace{5y}_{\text{amount in 5€}}. \text{ So}$$

$$500 - 20 \times 43 = -20y + 5y \Leftrightarrow -15y = -360 \Leftrightarrow y = 24$$

They have collected 24 notes of 5€ and 19 of 20€.