

# Evaluation of the 4th Form Pupils' Level of Knowledge on the Concept of Inequation of 1st and the 2nd Degrees with One Unknown Factor in the Set $\mathbb{R}$ : CASE of Pupils from Official Secondary Schools of the Karisimbi Commune, in the Goma Town, Dr Congo

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**Abstract:** *The present work consists in an assessment of the knowledge of the pupils of 4<sup>th</sup> secondary school from Karisimbi commune, in the Goma town, on the notion of inequations of 1<sup>st</sup> and 2<sup>nd</sup> degree with one unknown factor in the set  $\mathbb{R}$ . To lead this research, we formulated a questionnaire of investigation that we submitted to 200 pupils from 8 schools, in Karisimbi Commune, in the Goma town, and gave us the results below: - 96 pupils succeeded, to say 48% of success, with an average of 49, 17%. Thus, the level of knowledge of the pupils from 4<sup>th</sup> secondary school in Karisimbi is low. Only Goma institute, Ecole du Cinquantenaire and Muungano Institute has respectively realized 63, 5%, 54, 45% and 50% as average. The other schools realized an average between 39, 62% and 49, 55%. The output of the pupils is influenced by the qualification and the seniority. However, the sex didn't influence on the output of the pupil.*

**Keywords:** Assessment, level, inequalities, 1<sup>st</sup> degree, 2<sup>nd</sup> degree

## 1. Introduction

Teaching, in the Democratic Republic of Congo, is, nowadays, going through a critical period characterized by the assumption of responsibility of the teachers by the parents, the plethoric classes, the disordered creation of schools without taking account of standards, under-teaching, the insufficiency of adapted infrastructures, the culture of the facility and the minimalism of the pupils, schools created for commercial purposes, etc. One of the obvious consequences of these problems is, certainly, the worrying fall of the level of the pupils. The disappointing results frequently met at these pupils are also revealing of this drawdown at the pupils. This sad report relates to all the branches of secondary education, including mathematics.

In this connection, a certain number of questions are posed: which would be the level of knowledge of the pupils of the 4th form secondary school in the official secondary schools of the Karisimbi commune on the concept of inequation of 1st and the 2nd degrees? Which would be the factors influencing this level of knowledge? Is it the qualification of the teachers? Is it the seniority of the teachers? Is it the sex of the pupils?

Having a regard to this questionnement, this research proposes to evaluate the level of knowledge of the pupils of fourth form of secondary school on the concept of inequation of 1<sup>st</sup> and the 2<sup>nd</sup> degrees with one unknown factor in the set  $\mathbb{R}$  and to identify the factors influencing this level.

## 2. Methodology

### 2.1 Population and sample of the study

#### 2.1.1 Population of study

The population to which our study related consists of secondary schools, teachers of Mathematics and pupils of 4th from the secondary schools of the official schools of the commune of Karisimbi in the town of Goma.

According to the urban subdivision of Epsp/nord-kivu I, the commune of Karisimbi counts 10 official secondary schools; The pupils concerned are respectively those having attended the 4th form secondary school during the school year 2017-2018 and the teachers concerned are those who have taught Mathematics in 4th form secondary school in the official schools of the Karsimbi commune, for the school year 2017-2018. These schools are: the Ndoshu institute, the Mugunga institute, the institute of Goma, the Tupendane institute, the Nyabushongo institute, the Mikeno institute, the Virunga Quartier Institute, the "Ecole du cinquantenaire", the Tuungane institute and the Muungano institute. Below the population of pupils in which we had sampled:

**Table 1:** Pattern of the settlement of pupils according to schools taken in the sample

N°	School	Girls	Boys	Total
1	Institute of Goma	102	97	199
2	Ndosho Institute	19	16	35
3	Tupendane Institute	37	54	91
4	Tuungane Institute	47	37	84
5	Virunga Quartier Institute	60	48	108
6	Ecole du cinquantenaire	27	85	110
7	Mikeno Institute	67	81	148
8	Muungano Institute	9	11	20
	Total	368	427	795

**2.1.2. Sample**

**2.1.2.1. Sample of schools**

Eight schools were concerned with our investigation. They are : the Ndosho institute, the institute of Goma, the Tupendane institute, the Tuungane institute, the Virunga Quartier Institute, the ‘Ecole du cinquantenaire’, the Tuungane institute and the Muungano institute.

**2.1.2.2. Sampling of the teachers**

According to the schools in our sample, 8 teachers of mathematics in the 4th form in the official secondary schools of the Karisimbi commune were retained in our sample. The qualification and their seniority are represented in the table below:

**Table 2:** Qualification and under qualification of the teachers of Mathematics retained in our sample.

No.	School	QT	NQT	UQT
01	Institute of Goma	1	0	50
02	School of the Fiftieth anniversary	1	0	28
03	Tuungane Institute	1	0	21
04	Mikeno Institute	0	1	37
05	Tupendane Institute	0	1	23
06	Virunga Quartier Institute	1	0	27
07	Muungano Institute	0	1	5
08	Ndosho Institute	1	0	9
	Total	05	03	200

Legend: QT: Qualified teachers; NQT: Not Qualified teachers; UQT: Un qualified teachers.

Comment: According to CINYABUGUMA K. M. (1995-1996):

- **The qualified teachers**, for the teaching of Mathematics in secondary school, are those having a diploma of Graduate or License in Pedagogy applied to mathematics.
- **The teachers not qualified** in teaching of mathematics in secondary school are those having a diploma of higher education or Academic other than that in Pedagogy applied to mathematics.
- **The teachers under qualified** in teaching of mathematics in secondary school are those having no diploma of higher education or university.

**2.1.2.3 Sample of pupils**

From the 795 pupils above, we had drawn a sample laminated from 200 pupils, that is to say approximately 25%

of the total staff complement, as it is indicated in the following table:

**Table 3:** Distribution of the pupils in the sample

No	School	Girls	Boys	Total
01	Institute of Goma	26	24	50
02	School of the Fiftieth anniversary	7	21	28
03	Tuungane Institute	12	09	21
04	Mikeno Institute	15	22	37
05	Tupendane Institute	9	14	23
06	Virunga Quartier Institute	15	12	27
07	Muungano Institute	3	2	5
08	Ndosho Institute	6	3	9
	Total	93	107	200

**Table 4:** Distribution of the pupils in the sample according to the seniority and the qualification of their teachers

Seniority of the teachers			Qualification of the teachers			
0-3years	More than 3 years	Total	PQT	PNQT	PUQT	Total
99	101	200	135	65	0	200

**Legend:** PQT: Pupils with qualified teachers; PNQT: Pupils with not qualified teachers; PUQT: Pupils with under qualified teachers.

**Comment:** Of the 200 pupils constituting our sample of pupils:99, i.e. 49, 5%, have teachers of Mathematics to lower seniority or equalizes with 0 to 3 years;101, i.e. 50, 5%, have teachers of Mathematics to seniority higher than 3 years . In the same way, 135 pupils, i.e. 67, 5%, have qualified teachers;65, i.e. 32, 5%, have teachers not qualified and none the teachers concerned is under qualified in teaching Mathematics.

**2.2 Survey questionnaire**

To conclude this research, an investigation had been made by the means of a questionnaire addressed to the pupils of 4<sup>th</sup> form of the official schools secondary constituting our sample. The investigation was made by direct administration i.e. the guarantor notes itself the answers on the questionnaire (JAVOT, 1972).

During the construction of the survey questionnaire, we respected the following principles, as BAMWISHO M. recommends it, (1979):Precision of the objective of the test, determination of the contents of the test, the pretest, the test itself and statistical analysis of the results.

Like BAMWISHO M. (1979, p.35) points out it, the development of a test according to the traditional method of psychometry requires a preliminary a pretest to evaluate the percentage of success to each item. The too difficult items are isolated (A. WATHELET, 1966, p.30). L.DEYS (quoted by BAMWISHO M., 1972, p.41) proposes as limit of selection the items whose success varies between 10% and 90%).

R.PASQUASY (1961, p.18), as for him, estimates that, in practice, the items successful by 30% to .70% of the subjects are retained. For this research, we retained the items of which the percentage of the difficulties ranges between 10 and 90% as L. DEYYS recommends it (Quoted by J.

BAMWISHO, 1972, p.41).The easy items are those solved by more than 905% of the subjects, the average items solved by 10 to 75% of the subjects and the difficult items are those solved per less than 10% of the subjects.

A pretest of 15 items with multiple choices was applied in Mars 2018 to 22 pupils of the Nyabushongo Institute. After correction, 3 items had been isolated. What led to 12 questions for the final test. The final test had proceeded from the 10 to April 13<sup>th</sup>, 2018.

In what concerned quotation, 1 point was reserved for a successful answer and 0 point to a false answer or an omitted answer.

**2.3 Statistical analysis of the data**

To treat the data resulting from our investigations, we, on the one hand, calculated the average of each sub-group of the sample, by taking account of the various variables considered by this study and the parameters of discrepancy (quartiles inferior and superior, standard deviation) between the various members from same under group and, on the other hand, carried out the test of assumptions on two averages by using "Z" test to check if there exists or not, with the threshold of significance of 0.5, a significant statistical difference between the averages of the results carried out by the pupils according to the selected variables.

The standard deviation was calculated on the basis of Sd

$$\text{relation Sd} = \sqrt{\frac{\sum_{i=1}^k ni(\bar{x}_i - \bar{x})^2}{N}}$$

"Z" sometimes was calculated (zcal), sometimes read in an ad hoc statistical table (zlu);The zcal is given by the formula

$$Z_{\text{cal}} = \frac{|\bar{x}_1 - \bar{x}_2|}{\sqrt{\frac{sd_1^2}{n_1} + \frac{sd_2^2}{n_2}}}$$

These calculations were assisted by computer using the software R and the scientific computer.

Moreover, for each one of the sub-group constituting our sample, we determined the percentage of success % R knowing, after correction, the total number R of the successes; The output η, as for him, was determined by the

relation  $\eta = \frac{\bar{x} \cdot 100}{P}$ , where p represents the weighting of the questionnaire.

**3. Results and Discussion**

**3.1 Results of the pretest**

The results of the pretest are included in the following table:

**Table 5: Results of the pre-investigation**

N° of the question	Number of successes per question	Percentage of success per question
1	10	45, 4%
2	6	27, 27%
3	1	04, 5%
4	9	40, 9%
5	11	50%
6	3	13, 6%
7	11	50%
8	7	31, 8%
9	1	04, 5%
10	8	36, 3%
11	5	22, 7%
12	8	36, 3%
13	12	54, 5%
14	2	09%
15	5	22, 7%

**Comment:** the numbered questions 3, 9 and 14 were eliminated from the final questionnaire, according to the limits of selection of the questions, as defined by L DEYYIS (Quoted by J BAMWISHO, 1972, p.41), after pre-investigation.

**3.2 Results of the final test**

**3.2.1 Total results**

With the exit of the general knowledge test in mathematics on the concept of inequation of the first and the second degrees in 4<sup>th</sup> form in the official secondary schools of the Karisimbi commune, in the Goma town, during the school year 2017-2018, we ended to the total results mentioned again in the table below:

**Table 6: Total results by school**

No.	School	N	R	%R	$\bar{X}$	Sd	Q1	Q3	Me	m	Max	η in %
1	Ecole du cinquantenaire	28	18	64, 28	6, 536	2, 027261	3, 75	8	7, 8	1	11	54, 458
2	INST.DE GOMA	50	31	62	7, 62	2, 380962	3, 5	8	8, 5	3	11	63, 5
3	INST.VIRUNGA Quartier	27	10	37	5, 407	3, 284688	2, 3	7, 5	4, 8	1	11	45, 05
4	INST.NDOSHO	9	3	33, 3	5, 125	3, 270539	1, 93	5	4, 78	0	10	42, 7
5	INST TUPENDANE	23	7	30, 4	5, 81	3, 198360	2, 37	6, 82	4, 75	0	10	48, 4
6	INST MUUNGANO	5	2	40	6	3, 162278	3, 25	7, 25	4, 5	3	10	50
7	INST TUUNGANE	21	6	28, 5	4, 455	3, 173210	2, 2	6, 3	4, 6	0	11	37, 12
8	INST MIKENO	37	19	51, 3	5, 947	2, 609208	3	7, 75	6, 6	1	11	49, 55
	TOTAL	200	96	48	5, 9	2, 905775	3, 425	6, 75	4, 75	0	11	49, 16

Source: Our investigations

**Legend:**

N:inquired (sample size) ; %R : percentage of success;

INST: Institute

$\bar{X}$  : average; Sd: standard deviation;

Q1:quartile : lower ;

Q3:quartile higher Me: median m:minimum

Max: maximum; η : output

**Comment**

The data of the table above are an emanation of our investigations and statistical calculations. The examination of the situation by school, as represents by table n°6 drawn up, using the results obtained by the surveyed pupils, leads us to treat on a hierarchical basis the schools surveyed according to the output of the pupils, in the following way:

- 1) The ‘‘ Ecole du cinquantenaire’’, which organizes 4 options, of which the civil aviation, construction, petro chemistry and electronics, and where we examined 28 pupils of 4<sup>th</sup> form of secondary school , 18 pupils succeeded, i.e. 64, 28% of success, with an average of 6, 536 out of 12 and an output of 54, 458%.
- 2) The institute of Goma which organizes also 4 options, of which math-physics, biochemistry, general pedagogy and the commercial on and management, of which we examined 50 pupils, 31 pupils succeeded, i.e. 62% of success, with an average of 7, 62 out of 12 and an output of 63, 5%.
- 3) The VIRUNGA/QUARTIER institute which organizes 2 classes of 4th form and where we tested 27 pupils, 10 pupils succeeded, that is to say 37 % of success, with an average of 5, 407 out of 12 and an output of 45, 05%
- 4) The Ndoshho institute which organizes 2 classes of 4th form and where we tested 9 pupils 3 pupils succeeded, that is to say 33, 3% of success, with an average of 6, 125 out of 12 and an output of 55, 6%.
- 5) The Tupendane institute which organizes two classes of 4th form and where we tested 23 pupils, 7 pupils succeeded, i.e. 30, 4, 8% of success, with an average of 5, 81 out of 12 and an output of 48, 4%
- 6) The MUUNGANO institute which organizes only one class of 4th form of general pedagogy and where we

tested 5 pupils, 2 pupils succeeded, i.e. 40% of success, with an average of 6 out of 12 and an output of 50%

- 7) The Tuungane institute which organizes 3 classes of 4th form and where we tested 21 pupils , 6 pupils succeeded, i.e. 28, 57% of success with an average of 4, 455 out of 12 and an output of 37, 125%
- 8) The Mikeno institute which organizes 3 options, of which general Pedagogy, the Commercial and management and social technique, and where we examined 37 pupils, 19 pupils succeeded, that is to say 51, 35% of success, with an average of 5, 947 out of 12 and an output of 49, 55%.

By considering the output, we have the institute of Goma which takes the 1st place with an output of 63, 5%, followed by the ‘‘Ecole du cinquantenaire’’ with an output of 54, 458%, MUUNGANO institute with 50%, MIKENO institute with 49, 55%, VIRUNGA/QUARTIER institute with 48, 44%, NDOSHO institute with 46, 04%, TUPENDANE institute with 44, 88% and, at the end, comes TUUNGANE institute with 39, 62%.

The SD standard deviation of 2, 905775, i.e. 26, 41%, is raised and translated a difference in levels according to schools and/or even according to pupils of the same class.

All things considered, 96 pupils out of 200 succeeded, i.e. 48% and an output of 49, 17 %. These results testify to a low level of acquisition of knowledge the concept of inequation of the first and the second degrees by the surveyed pupils.

**3.2.2 Results of the pupils according to the sex**

By gathering the pupils according to the sex, we obtain the results consigned in the table below

**Table 7: Results according to the sex**

Sex of the pupils	N	R	%R	$\bar{x}$	Sd	Q1	Q3	Me	m	Max	$\eta$ in %
Female	93	44	47, 3	5, 843	2, 98331	3, 2	6, 8	4, 54	2	11	48, 74
Masculine	107	52	48, 5	6, 174	2, 818474	3, 79	6, 5	4, 86	0	11	51, 45
Total	200	96	48	5, 9	2, 905775	3, 425	6, 75	4, 75	0	11	49, 16

**Comment**

The results of this table reveal that on a total of 93 girls tested, 44 succeeded, i.e. 47, 3% of success with an average of 5, 843 out of 12 and an output of 48, 74% while on a total number of 107 boys tested, 52 made a success, of either 48, 5% of success, with an average of 6, 174 out of 12 and one output of 51, 45%.

Moreover, test Z indicates that to the threshold significance of 5%, there is not a significant difference between the results obtained by the girls and those obtained by the boys. Indeed:  $Z_{cal}=1, 104687 < 1, 96=Z_{tab}$ . It results, from this, that with the threshold of significance of 5%, the sex does

not influence the level of knowledge of the pupils of 4<sup>th</sup> form of the official secondary schools of the Karisimbi commune on the concept of inequation of 1st and 2nd degrees.

**3.2.3. Results of the pupils according to the seniority of the teachers**

The seniority of the teachers offered us possibility to gather the pupils in two categories: that of pupils whose seniority of the teacher of mathematics is lower or equal to 3 years and that of pupils whose seniority of the teacher of mathematics is strictly high. These results are summarized the table below:

**Table 9: Results of the pupils according to the seniority of the teachers**

Seniority of the teacher	N	R	R%	$\bar{x}$	Sd	Q1	Q3	Me	Min	Max	$\eta$ (in %)
0-3 years	99	43	43, 4	5, 764	2, 784843	3, 2	7, 46	4, 7	0	11	48, 03
More than 3 years	101	53	52, 4	6, 219	2, 4147708	3, 7	7, 77	6	0	11	51, 82
Total	200	96	48	5, 9	2, 905775	3, 425	6, 75	4, 75	0	11	49, 16

Source: Our investigations

**Comment**

The results of this table reveal that on the 99 pupils whose teachers have a seniority that is low or equal to 3 years, 43 succeeded, i.e. 43, 4% of success, with an average of 5, 764 out of 12 and an output of 48, 03% while out of 101 pupils whose teachers have a seniority strictly higher than 3 years, 53 succeeded, is 52, 4% of success, with an average of 6, 219 out of 12 and an output of 52, 4%.

Test Z indicates that there is a significant statistical difference between the two categories. Indeed, with the threshold of significance of 5%,  $Z_{cal} = 1,994571661 > 1,96 = Z_{tab}$

The average of the pupils whose seniority of the teachers is lower or equal to 3 years being lower than that of the pupils

whose seniority of the teachers is strictly higher than 3 years, we conclude that the seniority of the teachers positively influences the level and the output of the pupils of 4<sup>th</sup> form of the official secondary schools in the Karisimbi commune, in the town of Goma, on the concept of inequation of the 1<sup>st</sup> and the second degrees. This is quite normal because "the experiment makes wise", says one.

**3.2.4 Results of the pupils according to the qualification of the teachers**

The qualification of the teachers offered us possibility to gather the pupils in three categories: Those whose teachers are qualified, those whose teachers are under-are qualified and them whose teachers are not qualified. This categorization led to the results gathered in the table below:

**Table 10: Results of the pupils according to the qualification of their teachers**

Category of pupils	N	R	%R	$\bar{X}$	Sd	Q1	Q3	Me	Min	Max	$\eta$ (in%)
PTQ	135	72	53,3	6,915	2,975441	3,8	8	7	1	11	57,62
PTNQ	65	24	36,92	5,471	2,821086	3,6	7,5	4,68	0	9	45,59
PTUQ	0	-	-	-	-	-	-	-	-	-	-
Total	200	96	48	5,9	2,905775	3,425	6,75	4,95	0	11	49,16

Source: our investigations

**Comment:** the results of this table reveal that:

- On the 135 pupils whose teachers are qualified for the teaching of mathematics, 72 succeeded, that is to say 53, 3% of success, with an average of 6, 915 out of 12 and an output of 57, 62%
- On 66 pupils whose teachers are not qualified for the teaching of mathematics, 24 succeeded, that is to say 36, 92%, of success, with an average of 5, 471 out of 12 and an output of 45, 59%
- No case of teacher under qualified was announced in these schools.

Test Z indicates that there are a significant statistical difference between the level of the pupils whose teachers are qualified and those whose teachers are not qualified for the teaching of mathematics because  $Z_{cal} = 5,644690743 > 1,96 = Z_{tab}$ , with the threshold of 5%.

The average of the pupils whose teachers are qualified being higher than that of the pupils whose teachers are not qualified for the teaching of mathematics, we conclude that the qualification of the teachers positively influences the level and the output of the pupils of 4<sup>th</sup> form of the official secondary schools of the Karisimbi commune, in Goma the town, on the concept of inequation of 1st and second degrees. This is normal because, according to wise: "To each one its place and the ewes will be well kept".

**4. Conclusion**

The present research consisted in, on the one hand, evaluating the level of knowledge of the pupils of fourth secondary year of the official schools of the commune of Karisimbi, in the town of Goma, on the concept of inequation of the first and the 2nd degrees for the school year 2017-2018 and, in addition, to raise of the factors influencing this level.

¶The research undertaken through a questionnaire addressed to 200 pupils of fourth form of 8 official secondary schools of the Karisimbi commune, in the town of Goma, revealed a low level of knowledge of these pupils on the concept of inequation of 1st and the 2nd degrees in the unit □. The average obtained by these pupils is 5, 9 out of 12 points, that is to say an output of 49, 16%.¶

By considering the output, we have the institute of Goma which takes the 1st place with an output of 63, 5%, followed school of the "Ecole du cinquantenaire" with an output of 54, 458%, MUUNGANO institute with 50%, MIKENO institute with 49, 55%, the Virunga-Quartier institute with 48, 44%, NDOSHO institute with 46, 04%, TUPENDANE institute with 44, 88% and, at the end, comes TUUNGANE institute with 39, 62%.

About various parameters tested, there was not an significant statistical difference between the kinds (girls and boys) in the official secondary schools of the Karisimbi commune, in Goma town, but there is a significant statistical difference, on the one hand, between the output of the pupils whose teachers have a seniority strictly higher than 3 years and those whose teachers have a seniority lower or equal to 3 years, son the other, between the output of the pupils whose teachers are qualified for the teaching of mathematics and that of the pupils whose teachers are not qualified for teaching

Thus, the level of the pupils, on the concept of inequation of 1st and the 2nd degree with one unknown factor, is thus influenced by the seniority and the qualification of their teachers. On the other hand, the parameter sex does not have any effect on the output on the output of the pupils.

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V.I Appendix: Survey Questionnaire Addresses to Raised 4<sup>th</sup> Secondary of the official Schools of the Karimbi Commune, in the Goma Town

This questionnaire lies within the scope of a research aiming to evaluate the level of knowledge of the pupils of 4th secondary school relating to the concept of inequation of the first and the second degree in the unit  $\square$ . We beg you to contribute to it while answering objectively and clearly this questionnaire. We guarantee to keep the anonymity of your answers.

A. IDENTITE DE L'ENQUETE

Sexe : M  F

Ecole

.....  
 .....

Classe/option

.....  
 .....

B. QUESTIONNAIRE PROPREMENT DIT

Consigne: Pour chaque question, encrer la lettre correspondant bonne réponse ou indiquer f s'il n'y a pas de bonne réponse ou s'il y en a plusieurs

1. Parmi les inéquations dans  $\square$  suivantes, celle qui est indéterminée est :  
 a.  $0x > 3$  b.  $0x \geq 0$  c.  $0x < 0$  d.  $0x < -2$  e. Autre réponse  
 2. une inéquation du premier degré à une inconnue x dans  $\square$  ne peut pas être de la forme :

- a.  $b + ax < 0$  b.  $ax + b \geq 0$  c.  $ax + b = 0$  d.  $ax + b \leq 0$  e.  $ax + b > 0$   
 3. L'inéquation  $ax^2 + bx + c \geq 0$ , à une inconnue x dans  $\square$ , admet  $\square$  comme ensemble des solutions si :  
 a.  $\Delta = b^2 - 4ac \leq 0$  et  $a > 0$  b.  $a < 0$  et  $\Delta = b^2 - 4ac > 0$  c.  $a < 0$  et  $\Delta = b^2 - 4ac \geq 0$  d.  $a < 0$  et  $\Delta = b^2 - 4ac \leq 0$  e.  $a \neq 0$  et  $\Delta = b^2 - 4ac \geq 0$   
 4. L'ensemble de solution de l'inéquation  $-x^2 + 6x - 9 < 0$  dans  $\square$  est :  
 a.  $]3; +\infty[$  b.  $] -\infty; 3[$  U  $]3; +\infty[$  c.  $] -\infty; 3[$  U  $]3; +\infty[$  d.  $] -\infty; +\infty[$  e. aucune réponse  
 5. L'ensemble des solutions de l'inéquation  $\frac{2x-1}{5x+3} \geq 0$  dans  $\square$  est :  
 a.  $R$  b.  $] -\infty; -\frac{3}{5}[$  U  $[\frac{1}{2}; +\infty[$  c.  $] -\frac{3}{5}; \frac{1}{2}[$  d.  $] -\infty; -\frac{3}{5}[$  U  $[\frac{1}{2}; +\infty[$  e. Autre réponse  
 6. Tous les éléments de la partie  $S = ]-\infty; -\frac{4}{3}] \cup [0, 4[$  de  $\square$  sont des solutions de l'inéquation  $\frac{(4+3x)(-x^2+2x-6)}{3x^2-12x} \geq 6$ , à l'exception de(des) :  
 a. 0, b 0 et 4 c.  $-\frac{4}{3}$  d. Des éléments de l'ensemble  $[0, 4[$  e. 0, 4 et  $-\frac{4}{3}$   
 7. Dans  $\square$ ,  $S = \{x/x \in R \text{ et } -3 \leq X \leq 1\}$  est l'ensemble-solution de l'inéquation :  
 a.  $(x-2)^2 \leq 2X$  b.  $3X^2 \geq 8$  c.  $(x-1)^2 > 4$  d.  $(4-2x)^2 \leq 9$  e.  $(x-3)^2 \geq 4x^2$   
 8. Dans  $\square$ , l'inéquation admettant  $S = ]-\infty; -1[ \cup ]2; +\infty[$  comme ensemble des solutions est :  
 a.  $\frac{x+1}{x-2} < 0$  b.  $\frac{x-2}{x+1} > 0$  c.  $\frac{x+1}{x-2} \leq 0$  d.  $\frac{x+1}{x-2} \geq 0$  e.  $\frac{x-2}{x+1} \geq 0$   
 9. Dans  $\square$ , l'ensemble  $S = \{x \in R / -1 < X < 8\}$  est solution de l'inéquation :  
 a.  $5x - 6 \geq 4$  b.  $|2x - 5| \geq 5$  c.  $|2x - 3| < 5$  d.  $|x - 3| < 8$  e.  $2 < |2x - 5|$   
 10. Une des inéquations suivantes admet  $\square$  comme ensemble des solutions. Il s'agit de :  
 a.  $2x^2 + 1 < 0$  b.  $x^2 - x - 2 \geq 0$  c.  $x^2 + 3x \leq 4$  d.  $x^2 + 9 < 6x$  e.  $x^2 + 7 > 3x$   
 11. Dans  $\square$ , l'inéquation  $\frac{x}{2-x} \geq \frac{2x+10}{x^2+3x-10}$  a pour ensemble des solutions :  
 a.  $S = ]-\infty; -5[ \cup ]-2, 2[ \cup ]2; +\infty[$   
 b.  $S = ]-5; -2[ \cup ]2; +\infty[$  c.  $S = ]-\infty; -5[ \cup ]2; +\infty[$  d.  $S = ]-\infty; -2[ \cup ]-2, 2[ \cup ]2; +\infty[$  e.  $S = ]-\infty; -5[ \cup ]-5; -2[ \cup ]2; +\infty[$   
 12. Dans  $\square$ , l'ensemble de solution de l'inéquation  $\frac{5x^2 - 4x - 1}{-2x^2 + x - 1} \geq 2$  est :  
 a.  $S = \{\frac{1}{3}\}$  b.  $] -\infty; -\frac{1}{3}[$  U  $[\frac{1}{3}; +\infty[$  c.  $S = \emptyset$  d.  $S = \square$  e.  $S = R \setminus \{\frac{1}{3}\}$

13. Le carré d'un nombre réel diminué de son double est strictement inférieur à sa moitié augmentée de 1. Ce nombre réel est un élément de l'ensemble :

a.  $]-\infty, -1/2[$  b.  $]3, +\infty[$  c.  $]-\infty, 3]$  d.  $[-\frac{1}{2}, +\infty[$  e.  $]-1/2, 3[$

14. Dans  $\square$ , l'inéquation

$$\frac{(x-1)(5+2x)^{24}(2x^2+2x-2)^5}{(2-3x)^{17}(-x^2+2x-3)} \leq 0$$

a pour ensemble

des solutions :

a.  $S = ]-\infty, -3] \cup [-\frac{5}{2}, \frac{2}{3}[ \cup ]1, 2[$  b.  $S =$

$[-3, \frac{2}{3}[ \cup ]1, 2[ \cup ]2, +\infty[$  c.  $S = [-3, \frac{2}{3}[ \cup ]1, 2[$

d.  $S = [-3, \frac{2}{3}[ \cup ]1, 2[$  e.  $S = [-3, \frac{2}{3}[ \cup ]1, 2[$

15. Dans  $\square$ , l'ensemble des solutions de l'inéquation  $|3x-1| \leq 1$  est :

a.  $[0, \frac{2}{3}]$  b.  $]-\infty, 0] \cup [\frac{2}{3}, +\infty[$  c.  $]0, 2/3[$  d.  $\emptyset$  e.  $\square$

