



Diplôme: Ingénieur
Domaine: Sciences et Technologies
Année d'étude: 1ère-ST ingénieur

PV DE NOTES - Contrôle Continu+Examen

Matière: *Algèbre 1*
Enseignant: *Badi Sabina*

Groupe: ST-ING
(1)

2025/2026

N°	Matricule	Nom	Nom	Signature	Pondérations en %		
					40%	60,00%	100%
					MOY, CC	EXAMEN	MOY, MTR
1	UN24012025252536246706	ABDAOUI	ALA	<i>[Signature]</i>		05,00	
2	UN24012025242436266108	AMAMRA	YOUCEF	<i>[Signature]</i>		03,00	
3	UN24012025252536248210	AZZOUZ	RITEDJ	<i>[Signature]</i>		10,00	
4	UN24012025242436277320	BOUAFIA	ZAID	<i>[Signature]</i>		09,25	
5	UN24012025242536302818	BOUGUERRA	SADJEDA	<i>[Signature]</i>		11,50	
6	UN24012025252536251007	BOUHARKAT	NOUHA	<i>[Signature]</i>		12,75	
7	UN24012025252536253603	BOUKHENAF	HADJER	<i>[Signature]</i>		12,00	
8	UN24012025252536251512	BOUNEFLA	YOUNNA	<i>[Signature]</i>		09,50	
9	UN24012025252536253318	GUEROUI	ABDERRAOUF	<i>[Signature]</i>		08,00	
10	UN24012025252536251311	HADADI	WAIL SAID	<i>[Signature]</i>		05,50	
11	UN24012025242436243907	HALLACI	ISLEM	<i>[Signature]</i>		05,25	
12	UN24012025252536249915	HAMMOUDA	MOUAID NEDJM EDDINE	<i>[Signature]</i>		10,50	
13	UN24012025242436239715	HARIDI	ZAKARYA	<i>[Signature]</i>		11,25	
14	UN24012025252534235516	KECHROUD	REDOUANE AYOUB	<i>[Signature]</i>		04,25	
15	UN24012025252536250518	KETTACHE	MERYEM NOUR EL HOUDA	<i>[Signature]</i>		07,50	
16	UN24012025232436300510	KHALLA	MOHANED	<i>[Signature]</i>		12,00	
17	UN24012025252536249705	MEZHOUDI	KATRENNADA	<i>[Signature]</i>		06,00	
18	UN24012025242536306106	MOUHIDDINE	MOUNDER	<i>[Signature]</i>		05,50	
19	UN24012025252536250305	NACER	MOHAMED LOTFI	<i>[Signature]</i>		08,50	
20	UN24012025242436242104	NAKHLA	NAILA WALA	<i>[Signature]</i>		10,00	
21	UN24012025232536304707	SOUALMIA	KOŞAI				
22	UN24012025252536250209	STITI	MOHAMMED ZAKARYA	<i>[Signature]</i>		07,75	
23	UN24012025252536248311	STITI	RAZANE	<i>[Signature]</i>		06,75	
24	UN24012025242436238311	YADIOU	ALA	<i>[Signature]</i>		02,00	
25	UN24012025252536249312	ZERKAOUI	ABDERRAHMENE	<i>[Signature]</i>		04,50	
26	UN24012025252536247807	ZIADA	TAQWA	<i>[Signature]</i>		03,00	
27	UN24012025242436270116	ZOUIDI	RAMI SAID	<i>[Signature]</i>		09,00	

Date et Signature

Le 21 mai 2026 *[Signature]*



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Matière: Algèbre 1
Enseignant: Badi Sabrina

Groupe: ST-ING
(2)

2025/2026

N°	Matricule	Nom	Prénoms	Signature	Pondérations en %		
					40%	60,00%	100%
					MOY, CC	EXAMEN	MOY,MTR
1	UN24012025252536253205	AGGOUN	IYED ANIS EDDINE			03,00	
2	UN24012025252536274317	BELLAA	ZAKARIA			09,00	
3	UN24012025252536260706	BEN AMAR	SIHAM			09,50	
4	UN24012025252536266404	BENSAADOUNE	IDRIS			00,00	
5	UN24012025252536285901	BENSALEM	ADEM			00,00	
6	UN24012025252536252702	BOUFEKEN	Ahmed amin				
7	UN24012025252536252801	BOURAZI	ABDENNOUR			01,50	
8	UN24012025252536276617	BRAHMIA	AYOUB			10,75	
9	UN24012025252536281911	CHERRAD	ABIR			02,00	
10	UN24012025252536269817	DERGA	SALAH EDDINE				
11	UN24012025252536284406	DIH	NOUR ELHOUDA			04,50	
12	UN24012025252536253214	DOUAOURI	DARINE			09,75	
13	UN24012025252536276901	GHAOUI	ABDERAOUF			14,00	
14	UN24012025252536251909	GHERAB	ALAAEDDINE			17,25	
15	UN24012025252536266510	GHERIB	MOHAMED ADEM			01,00	
16	UN24012025252536253910	GUERNINE	HADIL			10,00	
17	UN24012025252536284704	HACHANI	ZAKARIA			11,50	
18	UN24012025252536269319	HEZILI	BASSIM				
19	UN24012025252536264818	LAYADA	DOUAA			08,50	
20	UN24012025252536269214	LECHEHEB	ISRA			06,75	
21	UN24012025252536274617	MENAIJAIA	MARIA			07,00	
22	UN24012025252536261309	MENTSEUR	HADIL			04,00	
23	UN24012025252536308511	MIMOUN	BADREDDINE			02,25	
24	UN24012025252536262019	SAIOUDI	MERIEEM			09,75	
25	UN24012025252536274819	SLIMANI	NOURELIKRAM			11,50	
26	UN24012025252536274703	SOUAIBIA	MOHAMED DAIEDDINE			00,50	

Date et Signature

Le 21/01/2026



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PV DE NOTES - Contrôle Continu+Examen

Matière: *Algèbre 1*
Enseignant: *Badi Sabrina*

Groupe: GC-ING
(1)

2025/2026

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					40%	60,00%	100%
					MOY, CC	EXAMEN	MOY,MTR
1	UN24012025252536253415	ABDAOUI	MOHAMED	<i>[Signature]</i>		02,00	
2	UN24012025252536257912	ALLIOUET	RIHAM	<i>[Signature]</i>		03,00	
3	UN24012025242436266714	AMRI	TAHA ANES			/	
4	UN24012025242436244408	BALI	TAQIYEDDINE	<i>[Signature]</i>		04,00	
5	UN24012025252536253417	BENCHEIKH	MOHAMMED AMIN	<i>[Signature]</i>		01,50	
6	UN24012025252536253207	BOURAGHDA	TAQIEDDINE			/	
7	UN24012025242436244801	BOURENANE	MEHDI ABDERRAHMEN	<i>[Signature]</i>		06,25	
8	UN24012025242436262909	CAYD	AMANI	<i>[Signature]</i>		06,25	
9	UN24012025252536253114	CHABANE	IDRIS	<i>[Signature]</i>		01,00	
10	UN24012025242436262904	CHOUIEB	AHMED YACINE	<i>[Signature]</i>		01,00	
11	UN24012025242536309508	DRISSI	ROUDEINA	<i>[Signature]</i>		07,75	
12	UN24012025252536253310	ELBEKRI	CHAYMA	<i>[Signature]</i>		08,00	
13	UN24012025242536309509	GUERZIZ	RANINE	<i>[Signature]</i>		07,50	
14	UN24012025252536253107	HARRIDI	AMAL	<i>[Signature]</i>		05,25	
15	UN24012025242436244712	KHALLA	MOHAMED YACINE	<i>[Signature]</i>		05,50	
16	UN24012025252536281914	KOUADRI	MOUATEZ			/	
17	UN24012025252536253102	MAAFA	AMINA	<i>[Signature]</i>		01,50	
18	UN24012025252536253503	MADI	MOHAMMED ABD ESLEM	<i>[Signature]</i>		03,00	
19	UN24012025242436244620	MEBARKI	MOHAMMED ISLEM	<i>[Signature]</i>		04,50	
20	UN24012025242436278007	MEKNASSI	ISHAQ			/	
21	UN24012025252536253419	MOUSSAOUI	MOHAMMED ISLAM	<i>[Signature]</i>		00,50	
22	UN24012025252536281905	OUDJANI	DJOUHEYNA	<i>[Signature]</i>		01,50	
23	UN24012025252536253315	RADJATTI	TAHER ISLAM	<i>[Signature]</i>		07,50	
24	UN24012025252536253413	SOUALMIA	LAMIS	<i>[Signature]</i>		03,75	
25	UN24012025242436273002	TADJINE	MEHDI	<i>[Signature]</i>		00,50	
26	UN24012025232336237104	YKHLEF	RIHAM			/	
27	UN24012025232336249620	ZAIDI	HADJER			/	
28	UN24012025252534407908	ZEROUL	MOUADH ABDELOUADOUD	<i>[Signature]</i>		00,50	

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Le 21/01/2021 *[Signature]*



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					40%	60,00%	100%
					MOY, CC	EXAMEN	MOY,MTR
1	UN24012025252536281904	AISSAOUI	BADREDDINE			/	
2	UN24012025252536257901	ALIOUAT	ACHOUAK			01,00	
3	UN24012025252536253614	AMARI	YAHIA ABD EL MOIZ			02,25	
4	UN24012025252536288807	AMIROUCHE	MOHAMMED TAHAR			01,00	
5	UN24012025252536257914	BELMARS	SOMIA			04,25	
6	UN24012025252536266514	BOUDJERIDA	MOUSSADEK			03,00	
7	UN24012025252536258011	BOUZAROURA	HANA			00,25	
8	UN24012025252536266501	CHAABNIA	SOUZIA			08,75	
9	UN24012025252536275803	CHATER	MOHAMED OUASSIM			05,50	
10	UN24012025252536266408	CHENICHENE	AMJED			01,50	
11	UN24012025252536266419	GHADJATI	SOUNDOUS			11,25	
12	UN24012025252536253103	GUERNINE	AYA			00,50	
13	UN24012025252536283004	HADJOU DJ	SERRADJEDDINE			00,75	
14	UN24012025252536271404	HAFADIA	ASMA			08,00	
15	UN24012025252536275804	KAHLOUCHI	MOHAMED WASSIM			/	
16	UN24012025252536253609	KHALED	WAIL			/	
17	UN24012025252536271414	KHATTABI	HANINE			02,50	
18	UN24012025252536253604	KIRATI	HADJER			04,50	
19	UN24012025252536266518	LAAMAIRIA	WALA INSAF			08,75	
20	UN24012025252536286701	LAHEG	AHMED SAMI			06,50	
21	UN24012025252536266401	LAMAIRIA	ARIDJ			10,00	
22	UN24012025252536271411	LEKCHITI	BESMALA			02,50	
23	UN24012025252536266417	MERAH	RAZANE			05,00	
24	UN24012025252536271515	MEZIANI	FERIAL			04,75	
25	UN24012025252536257920	MIMED	Abderrahmen			00,00	
26	UN24012025252536253606	SABER	HAZAR NOUR EL YAKIN			07,25	
27	UN24012025252536253519	SOUDANI	NIHAL			00,00	
28	UN24012025252536258004	ZIAITA	MOHAMMED OSEMA			/	

Date et Signature

20 21/01/2026



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Groupe: GP-ING

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					40%	60,00%	100%
					MOY, CC	EXAMEN	MOY, MTR
1	UN24012025232336246013	BENDERDOUKH	ABDOUMOUHAMED	<i>[Signature]</i>		03,25	
2	UN24012025252536266706	BENRABAA	KHADIDJA	<i>[Signature]</i>		07,25	
3	UN24012025252536280116	BENTABOUCHE	WASSIM	<i>[Signature]</i>			
4	UN24012025252536280102	BEZAA	AYMENE	<i>[Signature]</i>		00,25	
5	UN24012025252536287006	BOULAHIA	FARAH	<i>[Signature]</i>		05,50	
6	UN24012025252536271812	BOURABAA	ABDERRAHMEN	<i>[Signature]</i>		00,50	
7	UN24012025252536271811	CHEGHIB	TAHA	<i>[Signature]</i>		09,00	
8	UN24012025242436263316	CHEIKH	ABD EL RRZZEK	<i>[Signature]</i>		00,50	
9	UN24012025252536266810	CHENA	HADIL	<i>[Signature]</i>		09,75	
10	UN24012025242536310105	CHERGUI	INES	<i>[Signature]</i>		03,00	
11	UN24012025252536271815	CHIBANE	ABDELOUADOUD	<i>[Signature]</i>		00,00	
12	UN24012025252536277812	CHOUABBI	YOUNES	<i>[Signature]</i>		01,00	
13	UN24012025252536287005	ELMAADI	ADIL	<i>[Signature]</i>		01,00	
14	UN24012025242436245009	FEHADA	RAMZI	<i>[Signature]</i>			
15	UN24012025252536266807	GHEDJATI	MAY	<i>[Signature]</i>		09,75	
16	UN24012025252536287009	HACHOUF	HAITHAM SEIF EDDINE	<i>[Signature]</i>			
17	UN24012025252536276008	HAFIANE	FATMA ZAHRA	<i>[Signature]</i>		08,50	
18	UN24012025252536266804	KASCHBAT	MALAK	<i>[Signature]</i>		06,50	
19	UN24012025252536258214	MCIOUD	NARIMANE	<i>[Signature]</i>			
20	UN24012025252536258202	MERABTI	TASNIM	<i>[Signature]</i>			
21	UN24012025242436270910	NACERI	FAREŠ EDDINE	<i>[Signature]</i>		04,00	
22	UN24012025252536284913	OUARTI	MAROUA	<i>[Signature]</i>		08,25	
23	UN24012025242436270904	REMACHE	RYM	<i>[Signature]</i>			
24	UN24012025242436270909	ZOUAI	ABDEYAKINE	<i>[Signature]</i>		03,00	

Date et Signature

Le 21/01/2026 *[Signature]*



Domaine: Sciences et Technologies

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PV DE NOTES - Contrôle Continu+Examen

Matière: *Algèbre 1.*
Enseignant: *Badi Sabrina*

Groupe: GM-ING

2025/2026

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					40%	60,00%	100%
					MOY, CC	EXAMEN	MOY, MTR
1	UN24012025252536286506	AOUAOUA	YASSER	<i>[Signature]</i>			
2	UN24012025252536288605	AOUISSI	ABDELDJALIL	<i>[Signature]</i>			
3	UN24012025252536286416	ARAAR	MADJD LOQMAN	<i>[Signature]</i>		00,50	
4	UN24012025252536252309	ATAMENIA	CHAYMA	<i>[Signature]</i>		04,00	
5	UN24012025252536286503	BENAIIDA	MIYADA	<i>[Signature]</i>			
6	UN24012025252536265903	BENCHEMAA	OUSSAMA	<i>[Signature]</i>			
7	UN24012025242436253304	BOUCENA	TOUKA	<i>[Signature]</i>			
8	UN24012025242436243612	BOUCHAHDANE	KAIS DHIA EDDINE	<i>[Signature]</i>		00,00	
9	UN24012025252536257502	BOUCHAREB	AMAL	<i>[Signature]</i>		02,00	
10	UN24012025252536252214	BOUNAB	OUSSAMA	<i>[Signature]</i>		03,00	
11	UN24012025252536252419	BRAHMIA	YACINE ABDELDJALIL	<i>[Signature]</i>		04,00	
12	UN24012025242436262610	CHEIKH	SALAH	<i>[Signature]</i>		08,25	
13	UN24012025252536252303	CHERIF	RAZANE	<i>[Signature]</i>		09,25	
14	UN24012025242436275801	CHORFA	ISHAK	<i>[Signature]</i>		08,00	
15	UN24012025252536286411	DEBABI	ABDELMADJED	<i>[Signature]</i>			
16	UN24012025252536252220	DERGHAL	RAID	<i>[Signature]</i>		02,00	
17	UN24012025252536265919	DJENDEL	ABDELFATAH	<i>[Signature]</i>		12,75	
18	UN24012025252536265904	DRAMNIA	ASMA	<i>[Signature]</i>		09,75	
19	UN24012025232336223402	FASSI	SEIF EL ISLAM	<i>[Signature]</i>		00,50	
20	UN24012025252536257505	GHERBIA	RIDHA	<i>[Signature]</i>		00,00	
21	UN24012025242436262617	HADDAD	ABDELMOUMEN	<i>[Signature]</i>			
22	UN24012025252536252304	HAMIDI	ZAKARIA	<i>[Signature]</i>			
23	UN24012025252536284702	KHELALFIA	ANIS	<i>[Signature]</i>		06,00	
24	UN24012025252536252219	MAOUI	DARINE	<i>[Signature]</i>		03,00	
25	UN24012025252536252320	MAOUI	LINA	<i>[Signature]</i>		05,00	
26	UN24012025252536265920	MESSADIA	ABDELMALEK	<i>[Signature]</i>		05,00	
27	UN24012025252536252210	MOHAMEDATNI	AYYOUB	<i>[Signature]</i>			
28	UN24012025252536265907	NAAMENIA	AMINE	<i>[Signature]</i>		07,00	
29	UN24012025242436243707	OULED DIAF	YASSINE	<i>[Signature]</i>			
30	UN24012025252536284708	RAHMANIA	OUIL ADELDJALIL	<i>[Signature]</i>			
31	UN24012025252531727903	ROUABHIA	MOHAMED SEYF EDDINE	<i>[Signature]</i>		03,00	
32	UN24012025242436243519	SAIDA	CHAHINE	<i>[Signature]</i>		07,25	
33	UN24012025252536265918	ZEDADRA	ABD RAOUF	<i>[Signature]</i>		01,75	
34	UN24012025252536252314	ZERARI	ABDERAHIM	<i>[Signature]</i>		08,25	

Date et Signature

Le 21/06/2026 Badi



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Domaine: Sciences et Technologies

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Matière: *Algèbre 1*
Enseignant: *Badi Sabuina*

Groupe: ELT-ING

2025/2026

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					40%	60,00%	100%
					MOY, CC	EXAMEN	MOY, MTR
1	UN24012025252536281702	ACHIRI	AKRAM	<i>[Signature]</i>		01,50	
2	UN24012025252536288606	AOUABDI	ABDERRAHMANE	<i>[Signature]</i>		/	
3	UN24012025232336249616	ARBA	MALAK	<i>[Signature]</i>		02,50	
4	UN24012025252536257711	ARIBI	WALID	<i>[Signature]</i>		00,50	
5	UN24012025252536252807	BELANI	FADI SEYF EDDINE	<i>[Signature]</i>		06,25	
6	UN24012025252536262006	BEN FAKHEUR	TADJ EDDINE	<i>[Signature]</i>		02,50	
7	UN24012025252536257712	BENCHOUK	YEHYA	<i>[Signature]</i>		04,25	
8	UN24012025252536266207	BOUCHBOUT	ABDERRAOUF	<i>[Signature]</i>		/	
9	UN24012025252536271206	BOUHLASSA	LINA	<i>[Signature]</i>		08,00	
10	UN24012025252536252714	BOUKHAROUBA	HASSEN	<i>[Signature]</i>		11,50	
11	UN24012025252536252910	BOURAHDOUN	YOUNES	<i>[Signature]</i>		03,50	
12	UN24012025252536257713	CHAHAT	YOUNES	<i>[Signature]</i>		03,50	
13	UN24012025252536252903	CHEKAROUA	MOATEZ ABDELLATIF	<i>[Signature]</i>		07,50	
14	UN24012025252536257707	DELIM	SELSABIL	<i>[Signature]</i>		02,00	
15	UN24012025242436244016	DERRADJI	MOHAMMED ANIS	<i>[Signature]</i>		01,50	
16	UN24012025252536281710	ELFIL	ABDERRAZAK	<i>[Signature]</i>		/	
17	UN24012025252536277520	HERAMZA	MALAK	<i>[Signature]</i>		01,25	
18	UN24012025252536257710	KAHALERRAS	HALA	<i>[Signature]</i>		12,00	
19	UN24012025252536252803	KHALLA	ALI	<i>[Signature]</i>		00,50	
20	UN24012025242436244102	KRIM	MERWAN	<i>[Signature]</i>		04,00	
21	UN24012025242436300412	MADI	ZAKARYA CHARAF EDDINE	<i>[Signature]</i>		/	
22	UN24012025242436243901	MAHBOUBI	ADEM	<i>[Signature]</i>		01,50	
23	UN24012025252536266203	OUAIFIA	AYOUB	<i>[Signature]</i>		/	
24	UN24012025232536308909	RACHAMI	BAHA EDDINE	<i>[Signature]</i>		/	
25	UN24012025252536257702	ZAIMEN	ILHAM	<i>[Signature]</i>		04,50	

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Le 21/01/2026 *[Signature]*

Course type 1

Exercise 1 (7pts)

1) we have:

$$\forall n \in \mathbb{N} : n < 2 \Rightarrow n = 0 \text{ or } n = 1$$

$$\text{for } n = 0 \Rightarrow n^2 = 0 = n \quad \checkmark$$

$$\text{for } n = 1 \Rightarrow n^2 = 1 = n \quad \checkmark$$

Then P is True.

$$\bar{P} : \exists n \in \mathbb{N} : n < 2, n^2 \neq n$$

The contrapositive:

$$\forall n \in \mathbb{N}, n^2 \neq n \Rightarrow n \geq 2$$

$$A \setminus B = \{-1\}; B \setminus A = \emptyset$$

$$A \Delta B = (A \setminus B) \cup (B \setminus A) = \{-1\}$$

$$A \times B = \{(-1,0), (-1,3), (0,0), (0,3), (3,0), (3,3)\}$$

$$C_B = \{x \in A, x \notin B\} = \{-1\}$$

we have:

$$(A \setminus B) \cap (C \setminus D) = (A \cap \bar{B}) \cap (C \cap \bar{D})$$

$$= (A \cap C) \cap (\bar{B} \cap \bar{D})$$

$$= (A \cap C) \cap \overline{(B \cup D)}$$

$$= (A \cap C) \setminus (B \cup D)$$

Exercise 2 (4pts)

R transitive $\Leftrightarrow \forall x, y, z \in \mathbb{R}^d$:

$$x R y, y R z \Rightarrow x R z$$

we have:

$$\left. \begin{array}{l} x R y \\ y R z \end{array} \right\} \Rightarrow \begin{cases} y(x^2+1) = x(y^2+1) \\ z(y^2+1) = y(z^2+1) \end{cases}$$

$$\Rightarrow \begin{cases} y = \frac{x(y^2+1)}{x^2+1} \\ z(y^2+1) = \frac{x(y^2+1)}{x^2+1} (z^2+1) \end{cases}$$

$$\Rightarrow y(x^2+1) = x(z^2+1) \Rightarrow x R z$$

Then R is transitive.

$$f^{-1}\left(\left\{\frac{5}{4}\right\}\right) = \left\{x \in \mathbb{R} \mid f(x) = \frac{5}{4}\right\}$$

$$= \left\{x \in \mathbb{R} \mid \frac{1}{2(1+x^2)} + 1 = \frac{5}{4}\right\}$$

$$= \left\{x \in \mathbb{R} \mid 1+x^2 = 2\right\}$$

$$= \left\{x \in \mathbb{R} \mid x^2 = 1\right\} = \{-1, 1\}$$

$$f^{-1}(\{2\}) = \left\{x \in \mathbb{R} \mid f(x) = 2\right\} = \emptyset$$

we have:

$$f(-1) = f(1) = \frac{5}{4} \text{ but } -1 \neq 1 \Rightarrow f \text{ is not inj.}$$

$$f^{-1}(\{2\}) = \emptyset \Rightarrow f \text{ is not surj.}$$

Hence f is not bijective.

Exercise 3/ (6pts)

$$z_3 = \frac{z_1}{z_2} = \frac{1+i\sqrt{3}}{1+i} = \frac{(1+i\sqrt{3})(1-i)}{(1+i)(1-i)}$$

$$z_3 = \frac{1-i+i\sqrt{3}+\sqrt{3}}{1-i^2} = \frac{(1+\sqrt{3})+i(\sqrt{3}-1)}{2}$$

$$z_3 = \frac{1+\sqrt{3}}{2} + i \frac{\sqrt{3}-1}{2} \quad \text{2.5}$$

check: $z_1 = 1+i\sqrt{3}$

$$|z_1| = r_1 = \sqrt{1+3} = 2 \quad \text{0.5}$$

$$\left. \begin{aligned} \cos \theta_1 &= \frac{1}{2} \\ \sin \theta_1 &= \frac{\sqrt{3}}{2} \end{aligned} \right\} \Rightarrow \theta_1 = \frac{\pi}{3} : z_1 = 2e^{i\frac{\pi}{3}} \quad \text{0.5}$$

$$|z_2| = |1+i| = \sqrt{2} \quad \text{0.5}$$

$$\left. \begin{aligned} \cos \theta_2 &= \frac{\sqrt{2}}{2} \\ \sin \theta_2 &= \frac{\sqrt{2}}{2} \end{aligned} \right\} \Rightarrow \theta_2 = \frac{\pi}{4} : z_2 = \sqrt{2} \cdot e^{i\frac{\pi}{4}} \quad \text{0.5}$$

hence:

$$z_3 = \frac{2e^{i\frac{\pi}{3}}}{\sqrt{2}e^{i\frac{\pi}{4}}} = \sqrt{2} \cdot e^{i\frac{\pi}{12}} \quad \text{0.5}$$

$$= \sqrt{2} \left(\cos \frac{\pi}{12} + i \sin \frac{\pi}{12} \right)$$

we have:

$$z_3 = \sqrt{2} \cos \frac{\pi}{12} + i \sqrt{2} \sin \frac{\pi}{12} = \frac{1+\sqrt{3}}{2} + i \frac{\sqrt{3}-1}{2} \quad \text{0.5}$$

identification:

$$\sqrt{2} \cos \frac{\pi}{12} = \frac{1+\sqrt{3}}{2} \Rightarrow \cos \frac{\pi}{12} = \frac{1+\sqrt{3}}{2\sqrt{2}} \quad \text{0.5}$$

Exercise 4/ (3pts)

we have:

$(0,0) \notin F$ because

$$0+0=0 \neq 1$$

Then F is not a Vect. Sub.
space of $\mathbb{R}^2$.

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