

مكتب مستشار الرياضيات  
نموذج امتحان الجبر والهندسة الفراغية  
العام الدراسي ٢٠١٣ - ٢٠١٤

أعلم أن  $1 - \omega$  ، هي أحد الجذور التكعيبية غير الحقيقية للواحد الصحيح

أجب عن الأسئلة الآتية :

السؤال الأول : أكمل كلاً مما يأتي

- ① إذا كان  $l^{\omega} = r^{\omega}$  فإن قيمة  $r$  هي .....
- ② جميع الأعمدة المرسومة على مستقيم من نقطة عليه تقع في .....
- ③  $l^{\omega} + l^{\omega} + \dots + l^{\omega} + l^{\omega} + l^{\omega} = \dots$
- ④ مكتب مساحته السطحية  $٤٨$  سم مربع فإن طول قطره .....
- ⑤  $\omega = \frac{1}{91} + \omega$  .....

⑥ إذا وازى مستقيم كلاً من مستويين متقاطعين فإنه .....

السؤال الثاني

- ① أوجد الحد الخالي من  $\omega$  في مقلوك  $(\omega^2 - \frac{1}{\omega^3})$  وأوجد النسبة بينه وبين الحد الأوسط عندما  $\omega = 1$
- ② ج أ ب ، د أ ب مثلثان في مستويين مختلفين فإذا كانت  $\omega$  ،  $\nu$  ،  $\mu$  ،  $\xi$  منتصفات ج أ ، ج ب ، د أ ، د ب على الترتيب فثبت أن  $\omega \nu \parallel \mu \xi$  // المستوى د أ ب ، الشكل  $\omega \nu \xi \mu$  متوازي أضلاع .

السؤال الثالث

- ① أوجد باستخدام طريقة كرامر مجموعة حل المعادلات الآتية :  
 $\omega^2 - \nu^2 + \nu^2 = ٢$  ،  $\omega^3 + \xi^2 = ١٠$  ،  $\xi - \nu = ٥$
- ②  $\omega$  ،  $\nu$  مستويان ،  $\omega \cap \nu = \overline{أ ب}$  ، رسم المربع أ ب ج د في المستوى  $\omega$  ،  $\nu$  منتصف أ ب ،  $\mu$  منتصف ج د . رسم  $\overline{م ل} \perp$  المستوى  $\nu$  يقطعه في ل .  
① أثبت أن  $\overline{أ ب} \perp$  المستوى  $\nu$  م ل .  
② إذا كان  $\omega = (ل - أ ب - م) \leftrightarrow ٦٠^\circ$  فثبت أن المستوى أ م ل  $\perp$  المستوى ب م ل .

## السؤال الرابع

١ إذا كان  $z = 1 + i$  ،  $z^2 = (1 + i)^2 = 2i$  ،  $z^3 = (1 + i)^3 = 2 + 2i$  ،  $z^4 = (1 + i)^4 = 4$  ،  $z^5 = (1 + i)^5 = 4 + 4i$  ،  $z^6 = (1 + i)^6 = 8$  ،  $z^7 = (1 + i)^7 = 8 + 8i$  ،  $z^8 = (1 + i)^8 = 16$  ،  $z^9 = (1 + i)^9 = 16 + 16i$  ،  $z^{10} = (1 + i)^{10} = 32$  ،  $z^{11} = (1 + i)^{11} = 32 + 32i$  ،  $z^{12} = (1 + i)^{12} = 64$  ،  $z^{13} = (1 + i)^{13} = 64 + 64i$  ،  $z^{14} = (1 + i)^{14} = 128$  ،  $z^{15} = (1 + i)^{15} = 128 + 128i$  ،  $z^{16} = (1 + i)^{16} = 256$  ،  $z^{17} = (1 + i)^{17} = 256 + 256i$  ،  $z^{18} = (1 + i)^{18} = 512$  ،  $z^{19} = (1 + i)^{19} = 512 + 512i$  ،  $z^{20} = (1 + i)^{20} = 1024$  ،  $z^{21} = (1 + i)^{21} = 1024 + 1024i$  ،  $z^{22} = (1 + i)^{22} = 2048$  ،  $z^{23} = (1 + i)^{23} = 2048 + 2048i$  ،  $z^{24} = (1 + i)^{24} = 4096$  ،  $z^{25} = (1 + i)^{25} = 4096 + 4096i$  ،  $z^{26} = (1 + i)^{26} = 8192$  ،  $z^{27} = (1 + i)^{27} = 8192 + 8192i$  ،  $z^{28} = (1 + i)^{28} = 16384$  ،  $z^{29} = (1 + i)^{29} = 16384 + 16384i$  ،  $z^{30} = (1 + i)^{30} = 32768$  ،  $z^{31} = (1 + i)^{31} = 32768 + 32768i$  ،  $z^{32} = (1 + i)^{32} = 65536$  ،  $z^{33} = (1 + i)^{33} = 65536 + 65536i$  ،  $z^{34} = (1 + i)^{34} = 131072$  ،  $z^{35} = (1 + i)^{35} = 131072 + 131072i$  ،  $z^{36} = (1 + i)^{36} = 262144$  ،  $z^{37} = (1 + i)^{37} = 262144 + 262144i$  ،  $z^{38} = (1 + i)^{38} = 524288$  ،  $z^{39} = (1 + i)^{39} = 524288 + 524288i$  ،  $z^{40} = (1 + i)^{40} = 1048576$  ،  $z^{41} = (1 + i)^{41} = 1048576 + 1048576i$  ،  $z^{42} = (1 + i)^{42} = 2097152$  ،  $z^{43} = (1 + i)^{43} = 2097152 + 2097152i$  ،  $z^{44} = (1 + i)^{44} = 4194304$  ،  $z^{45} = (1 + i)^{45} = 4194304 + 4194304i$  ،  $z^{46} = (1 + i)^{46} = 8388608$  ،  $z^{47} = (1 + i)^{47} = 8388608 + 8388608i$  ،  $z^{48} = (1 + i)^{48} = 16777216$  ،  $z^{49} = (1 + i)^{49} = 16777216 + 16777216i$  ،  $z^{50} = (1 + i)^{50} = 33554432$  ،  $z^{51} = (1 + i)^{51} = 33554432 + 33554432i$  ،  $z^{52} = (1 + i)^{52} = 67108864$  ،  $z^{53} = (1 + i)^{53} = 67108864 + 67108864i$  ،  $z^{54} = (1 + i)^{54} = 134217728$  ،  $z^{55} = (1 + i)^{55} = 134217728 + 134217728i$  ،  $z^{56} = (1 + i)^{56} = 268435456$  ،  $z^{57} = (1 + i)^{57} = 268435456 + 268435456i$  ،  $z^{58} = (1 + i)^{58} = 536870912$  ،  $z^{59} = (1 + i)^{59} = 536870912 + 536870912i$  ،  $z^{60} = (1 + i)^{60} = 1073741824$  ،  $z^{61} = (1 + i)^{61} = 1073741824 + 1073741824i$  ،  $z^{62} = (1 + i)^{62} = 2147483648$  ،  $z^{63} = (1 + i)^{63} = 2147483648 + 2147483648i$  ،  $z^{64} = (1 + i)^{64} = 4294967296$  ،  $z^{65} = (1 + i)^{65} = 4294967296 + 4294967296i$  ،  $z^{66} = (1 + i)^{66} = 8589934592$  ،  $z^{67} = (1 + i)^{67} = 8589934592 + 8589934592i$  ،  $z^{68} = (1 + i)^{68} = 17179869184$  ،  $z^{69} = (1 + i)^{69} = 17179869184 + 17179869184i$  ،  $z^{70} = (1 + i)^{70} = 34359738368$  ،  $z^{71} = (1 + i)^{71} = 34359738368 + 34359738368i$  ،  $z^{72} = (1 + i)^{72} = 68719476736$  ،  $z^{73} = (1 + i)^{73} = 68719476736 + 68719476736i$  ،  $z^{74} = (1 + i)^{74} = 137438953472$  ،  $z^{75} = (1 + i)^{75} = 137438953472 + 137438953472i$  ،  $z^{76} = (1 + i)^{76} = 274877906944$  ،  $z^{77} = (1 + i)^{77} = 274877906944 + 274877906944i$  ،  $z^{78} = (1 + i)^{78} = 549755813888$  ،  $z^{79} = (1 + i)^{79} = 549755813888 + 549755813888i$  ،  $z^{80} = (1 + i)^{80} = 1099511627776$  ،  $z^{81} = (1 + i)^{81} = 1099511627776 + 1099511627776i$  ،  $z^{82} = (1 + i)^{82} = 2199023255552$  ،  $z^{83} = (1 + i)^{83} = 2199023255552 + 2199023255552i$  ،  $z^{84} = (1 + i)^{84} = 4398046511104$  ،  $z^{85} = (1 + i)^{85} = 4398046511104 + 4398046511104i$  ،  $z^{86} = (1 + i)^{86} = 8796093022208$  ،  $z^{87} = (1 + i)^{87} = 8796093022208 + 8796093022208i$  ،  $z^{88} = (1 + i)^{88} = 17592186044416$  ،  $z^{89} = (1 + i)^{89} = 17592186044416 + 17592186044416i$  ،  $z^{90} = (1 + i)^{90} = 35184372088832$  ،  $z^{91} = (1 + i)^{91} = 35184372088832 + 35184372088832i$  ،  $z^{92} = (1 + i)^{92} = 70368744177664$  ،  $z^{93} = (1 + i)^{93} = 70368744177664 + 70368744177664i$  ،  $z^{94} = (1 + i)^{94} = 140737488355328$  ،  $z^{95} = (1 + i)^{95} = 140737488355328 + 140737488355328i$  ،  $z^{96} = (1 + i)^{96} = 281474976710656$  ،  $z^{97} = (1 + i)^{97} = 281474976710656 + 281474976710656i$  ،  $z^{98} = (1 + i)^{98} = 562949953421312$  ،  $z^{99} = (1 + i)^{99} = 562949953421312 + 562949953421312i$  ،  $z^{100} = (1 + i)^{100} = 1125899906842624$  ،  $z^{101} = (1 + i)^{101} = 1125899906842624 + 1125899906842624i$  ،  $z^{102} = (1 + i)^{102} = 2251799813685248$  ،  $z^{103} = (1 + i)^{103} = 2251799813685248 + 2251799813685248i$  ،  $z^{104} = (1 + i)^{104} = 4503599627370496$  ،  $z^{105} = (1 + i)^{105} = 4503599627370496 + 4503599627370496i$  ،  $z^{106} = (1 + i)^{106} = 9007199254740992$  ،  $z^{107} = (1 + i)^{107} = 9007199254740992 + 9007199254740992i$  ،  $z^{108} = (1 + i)^{108} = 18014398509481984$  ،  $z^{109} = (1 + i)^{109} = 18014398509481984 + 18014398509481984i$  ،  $z^{110} = (1 + i)^{110} = 36028797018963968$  ،  $z^{111} = (1 + i)^{111} = 36028797018963968 + 36028797018963968i$  ،  $z^{112} = (1 + i)^{112} = 72057594037927936$  ،  $z^{113} = (1 + i)^{113} = 72057594037927936 + 72057594037927936i$  ،  $z^{114} = (1 + i)^{114} = 144115188075855872$  ،  $z^{115} = (1 + i)^{115} = 144115188075855872 + 144115188075855872i$  ،  $z^{116} = (1 + i)^{116} = 288230376151711744$  ،  $z^{117} = (1 + i)^{117} = 288230376151711744 + 288230376151711744i$  ،  $z^{118} = (1 + i)^{118} = 576460752303423488$  ،  $z^{119} = (1 + i)^{119} = 576460752303423488 + 576460752303423488i$  ،  $z^{120} = (1 + i)^{120} = 1152921504606846976$  ،  $z^{121} = (1 + i)^{121} = 1152921504606846976 + 1152921504606846976i$  ،  $z^{122} = (1 + i)^{122} = 2305843009213693952$  ،  $z^{123} = (1 + i)^{123} = 2305843009213693952 + 2305843009213693952i$  ،  $z^{124} = (1 + i)^{124} = 4611686018427387904$  ،  $z^{125} = (1 + i)^{125} = 4611686018427387904 + 4611686018427387904i$  ،  $z^{126} = (1 + i)^{126} = 9223372036854775808$  ،  $z^{127} = (1 + i)^{127} = 9223372036854775808 + 9223372036854775808i$  ،  $z^{128} = (1 + i)^{128} = 18446744073709551616$  ،  $z^{129} = (1 + i)^{129} = 18446744073709551616 + 18446744073709551616i$  ،  $z^{130} = (1 + i)^{130} = 36893488147419103232$  ،  $z^{131} = (1 + i)^{131} = 36893488147419103232 + 36893488147419103232i$  ،  $z^{132} = (1 + i)^{132} = 73786976294838206464$  ،  $z^{133} = (1 + i)^{133} = 73786976294838206464 + 73786976294838206464i$  ،  $z^{134} = (1 + i)^{134} = 147573952589676412928$  ،  $z^{135} = (1 + i)^{135} = 147573952589676412928 + 147573952589676412928i$  ،  $z^{136} = (1 + i)^{136} = 295147905179352825856$  ،  $z^{137} = (1 + i)^{137} = 295147905179352825856 + 295147905179352825856i$  ،  $z^{138} = (1 + i)^{138} = 590295810358705651712$  ،  $z^{139} = (1 + i)^{139} = 590295810358705651712 + 590295810358705651712i$  ،  $z^{140} = (1 + i)^{140} = 1180591620717411303424$  ،  $z^{141} = (1 + i)^{141} = 1180591620717411303424 + 1180591620717411303424i$  ،  $z^{142} = (1 + i)^{142} = 2361183241434822606848$  ،  $z^{143} = (1 + i)^{143} = 2361183241434822606848 + 2361183241434822606848i$  ،  $z^{144} = (1 + i)^{144} = 4722366482869645213696$  ،  $z^{145} = (1 + i)^{145} = 4722366482869645213696 + 4722366482869645213696i$  ،  $z^{146} = (1 + i)^{146} = 9444732965739290427392$  ،  $z^{147} = (1 + i)^{147} = 9444732965739290427392 + 9444732965739290427392i$  ،  $z^{148} = (1 + i)^{148} = 18889465931478580854784$  ،  $z^{149} = (1 + i)^{149} = 18889465931478580854784 + 18889465931478580854784i$  ،  $z^{150} = (1 + i)^{150} = 37778931862957161709568$  ،  $z^{151} = (1 + i)^{151} = 37778931862957161709568 + 37778931862957161709568i$  ،  $z^{152} = (1 + i)^{152} = 75557863725914323419136$  ،  $z^{153} = (1 + i)^{153} = 75557863725914323419136 + 75557863725914323419136i$  ،  $z^{154} = (1 + i)^{154} = 151115727451828646838272$  ،  $z^{155} = (1 + i)^{155} = 151115727451828646838272 + 151115727451828646838272i$  ،  $z^{156} = (1 + i)^{156} = 302231454903657293676544$  ،  $z^{157} = (1 + i)^{157} = 302231454903657293676544 + 302231454903657293676544i$  ،  $z^{158} = (1 + i)^{158} = 604462909807314587353088$  ،  $z^{159} = (1 + i)^{159} = 604462909807314587353088 + 604462909807314587353088i$  ،  $z^{160} = (1 + i)^{160} = 1208925819614629174706176$  ،  $z^{161} = (1 + i)^{161} = 1208925819614629174706176 + 1208925819614629174706176i$  ،  $z^{162} = (1 + i)^{162} = 2417851639229258349412352$  ،  $z^{163} = (1 + i)^{163} = 2417851639229258349412352 + 2417851639229258349412352i$  ،  $z^{164} = (1 + i)^{164} = 4835703278458516698824704$  ،  $z^{165} = (1 + i)^{165} = 4835703278458516698824704 + 4835703278458516698824704i$  ،  $z^{166} = (1 + i)^{166} = 9671406556917033397649408$  ،  $z^{167} = (1 + i)^{167} = 9671406556917033397649408 + 9671406556917033397649408i$  ،  $z^{168} = (1 + i)^{168} = 19342813113834066795298816$  ،  $z^{169} = (1 + i)^{169} = 19342813113834066795298816 + 19342813113834066795298816i$  ،  $z^{170} = (1 + i)^{170} = 38685626227668133590597632$  ،  $z^{171} = (1 + i)^{171} = 38685626227668133590597632 + 38685626227668133590597632i$  ،  $z^{172} = (1 + i)^{172} = 77371252455336267181195264$  ،  $z^{173} = (1 + i)^{173} = 77371252455336267181195264 + 77371252455336267181195264i$  ،  $z^{174} = (1 + i)^{174} = 154742504910672534362390528$  ،  $z^{175} = (1 + i)^{175} = 154742504910672534362390528 + 154742504910672534362390528i$  ،  $z^{176} = (1 + i)^{176} = 309485009821345068724781056$  ،  $z^{177} = (1 + i)^{177} = 309485009821345068724781056 + 309485009821345068724781056i$  ،  $z^{178} = (1 + i)^{178} = 618970019642690137449562112$  ،  $z^{179} = (1 + i)^{179} = 618970019642690137449562112 + 618970019642690137449562112i$  ،  $z^{180} = (1 + i)^{180} = 1237940039285380274899124224$  ،  $z^{181} = (1 + i)^{181} = 1237940039285380274899124224 + 1237940039285380274899124224i$  ،  $z^{182} = (1 + i)^{182} = 2475880078570760549798248448$  ،  $z^{183} = (1 + i)^{183} = 2475880078570760549798248448 + 2475880078570760549798248448i$  ،  $z^{184} = (1 + i)^{184} = 4951760157141521099596496896$  ،  $z^{185} = (1 + i)^{185} = 4951760157141521099596496896 + 4951760157141521099596496896i$  ،  $z^{186} = (1 + i)^{186} = 9903520314283042199192993792$  ،  $z^{187} = (1 + i)^{187} = 9903520314283042199192993792 + 9903520314283042199192993792i$  ،  $z^{188} = (1 + i)^{188} = 19807040628566084398385987584$  ،  $z^{189} = (1 + i)^{189} = 19807040628566084398385987584 + 19807040628566084398385987584i$  ،  $z^{190} = (1 + i)^{190} = 39614081257132168796771975168$  ،  $z^{191} = (1 + i)^{191} = 39614081257132168796771975168 + 39614081257132168796771975168i$  ،  $z^{192} = (1 + i)^{192} = 79228162514264337593543950336$  ،  $z^{193} = (1 + i)^{193} = 79228162514264337593543950336 + 79228162514264337593543950336i$  ،  $z^{194} = (1 + i)^{194} = 158456325028528675187087900672$  ،  $z^{195} = (1 + i)^{195} = 158456325028528675187087900672 + 158456325028528675187087900672i$  ،  $z^{196} = (1 + i)^{196} = 316912650057057350374175801344$  ،  $z^{197} = (1 + i)^{197} = 316912650057057350374175801344 + 316912650057057350374175801344i$  ،  $z^{198} = (1 + i)^{198} = 633825300114114700748351602688$  ،  $z^{199} = (1 + i)^{199} = 633825300114114700748351602688 + 633825300114114700748351602688i$  ،  $z^{200} = (1 + i)^{200} = 1267650600228229401496703205376$  ،  $z^{201} = (1 + i)^{201} = 1267650600228229401496703205376 + 1267650600228229401496703205376i$  ،  $z^{202} = (1 + i)^{202} = 2535301200456458802993406410752$  ،  $z^{203} = (1 + i)^{203} = 2535301200456458802993406410752 + 2535301200456458802993406410752i$  ،  $z^{204} = (1 + i)^{204} = 5070602400912917605986812821504$  ،  $z^{205} = (1 + i)^{205} = 5070602400912917605986812821504 + 5070602400912917605986812821504i$  ،  $z^{206} = (1 + i)^{206} = 10141204801825835211973625643008$  ،  $z^{207} = (1 + i)^{207} = 10141204801825835211973625643008 + 10141204801825835211973625643008i$  ،  $z^{208} = (1 + i)^{208} = 20282409603651670423947251286016$  ،  $z^{209} = (1 + i)^{209} = 20282409603651670423947251286016 + 20282409603651670423947251286016i$  ،  $z^{210} = (1 + i)^{210} = 40564819207303340847894502572032$  ،  $z^{211} = (1 + i)^{211} = 40564819207303340847894502572032 + 40564819207303340847894502572032i$  ،  $z^{212} = (1 + i)^{212} = 81129638414606681695789005144064$  ،  $z^{213} = (1 + i)^{213} = 81129638414606681695789005144064 + 81129638414606681695789005144064i$  ،  $z^{214} = (1 + i)^{214} = 162259276829213363391578010288128$  ،  $z^{215} = (1 + i)^{215} = 162259276829213363391578010288128 + 162259276829213363391578010288128i$  ،  $z^{216} = (1 + i)^{216} = 324518553658426726783156020576256$  ،  $z^{217} = (1 + i)^{217} = 324518553658426726783156020576256 + 324518553658426726783156020576256i$  ،  $z^{218} = (1 + i)^{218} = 649037107316853453566312041152512$  ،  $z^{219} = (1 + i)^{219} = 649037107316853453566312041152512 + 649037107316853453566312041152512i$  ،  $z^{220} = (1 + i)^{220} = 1298074214633706907132624082305024$  ،  $z^{221} = (1 + i)^{221} = 1298074214633706907132624082305024 + 1298074214633706907132624082305024i$  ،  $z^{222} = (1 + i)^{222} = 2596148429267413814265248164610048$  ،  $z^{223} = (1 + i)^{223} = 2596148429267413814265248164610048 + 2596148429267413814265248164610048i$  ،  $z^{224} = (1 + i)^{224} = 5192296858534827628530496329220096$  ،  $z^{225} = (1 + i)^{225} = 5192296858534827628530496329220096 + 5192296858534827628530496329220096i$  ،  $z^{226} = (1 + i)^{226} = 10384593717069655257060992658440192$  ،  $z^{227} = (1 + i)^{227} = 10384593717069655257060992658440192 + 10384593717069655257060992658440192i$  ،  $z^{228} = (1 + i)^{228} = 20769187434139310514121985316880384$  ،  $z^{229} = (1 + i)^{229} = 20769187434139310514121985316880384 + 20769187434139310514121985316880384i$  ،  $z^{230} = (1 + i)^{230} = 41538374868278621028243970633760768$  ،  $z^{231} = (1 + i)^{231} = 4153837486$