

ایستادگفت

18 Feb 2023 | ۲۹ | بهمن
۱۴۴۴ رجب ۲۷ | ۱/۵

۱۴۰۱

$f: \mathbb{R} \rightarrow \mathbb{R}$

تایید نمودن اینکه f یک تابع یک به یک است. $f(x) = 2x - 3$ در $\mathbb{R}$ تعریف شده است. $f(1) = -1$ و $f(2) = 1$ و $f(3) = 3$ و $f(4) = 5$ و $f(5) = 7$ و $f(6) = 9$ و $f(7) = 11$ و $f(8) = 13$ و $f(9) = 15$ و $f(10) = 17$ و $f(11) = 19$ و $f(12) = 21$ و $f(13) = 23$ و $f(14) = 25$ و $f(15) = 27$ و $f(16) = 29$ و $f(17) = 31$ و $f(18) = 33$ و $f(19) = 35$ و $f(20) = 37$ و $f(21) = 39$ و $f(22) = 41$ و $f(23) = 43$ و $f(24) = 45$ و $f(25) = 47$ و $f(26) = 49$ و $f(27) = 51$ و $f(28) = 53$ و $f(29) = 55$ و $f(30) = 57$ و $f(31) = 59$ و $f(32) = 61$ و $f(33) = 63$ و $f(34) = 65$ و $f(35) = 67$ و $f(36) = 69$ و $f(37) = 71$ و $f(38) = 73$ و $f(39) = 75$ و $f(40) = 77$ و $f(41) = 79$ و $f(42) = 81$ و $f(43) = 83$ و $f(44) = 85$ و $f(45) = 87$ و $f(46) = 89$ و $f(47) = 91$ و $f(48) = 93$ و $f(49) = 95$ و $f(50) = 97$ و $f(51) = 99$ و $f(52) = 101$ و $f(53) = 103$ و $f(54) = 105$ و $f(55) = 107$ و $f(56) = 109$ و $f(57) = 111$ و $f(58) = 113$ و $f(59) = 115$ و $f(60) = 117$ و $f(61) = 119$ و $f(62) = 121$ و $f(63) = 123$ و $f(64) = 125$ و $f(65) = 127$ و $f(66) = 129$ و $f(67) = 131$ و $f(68) = 133$ و $f(69) = 135$ و $f(70) = 137$ و $f(71) = 139$ و $f(72) = 141$ و $f(73) = 143$ و $f(74) = 145$ و $f(75) = 147$ و $f(76) = 149$ و $f(77) = 151$ و $f(78) = 153$ و $f(79) = 155$ و $f(80) = 157$ و $f(81) = 159$ و $f(82) = 161$ و $f(83) = 163$ و $f(84) = 165$ و $f(85) = 167$ و $f(86) = 169$ و $f(87) = 171$ و $f(88) = 173$ و $f(89) = 175$ و $f(90) = 177$ و $f(91) = 179$ و $f(92) = 181$ و $f(93) = 183$ و $f(94) = 185$ و $f(95) = 187$ و $f(96) = 189$ و $f(97) = 191$ و $f(98) = 193$ و $f(99) = 195$ و $f(100) = 197$ و $f(101) = 199$ و $f(102) = 201$ و $f(103) = 203$ و $f(104) = 205$ و $f(105) = 207$ و $f(106) = 209$ و $f(107) = 211$ و $f(108) = 213$ و $f(109) = 215$ و $f(110) = 217$ و $f(111) = 219$ و $f(112) = 221$ و $f(113) = 223$ و $f(114) = 225$ و $f(115) = 227$ و $f(116) = 229$ و $f(117) = 231$ و $f(118) = 233$ و $f(119) = 235$ و $f(120) = 237$ و $f(121) = 239$ و $f(122) = 241$ و $f(123) = 243$ و $f(124) = 245$ و $f(125) = 247$ و $f(126) = 249$ و $f(127) = 251$ و $f(128) = 253$ و $f(129) = 255$ و $f(130) = 257$ و $f(131) = 259$ و $f(132) = 261$ و $f(133) = 263$ و $f(134) = 265$ و $f(135) = 267$ و $f(136) = 269$ و $f(137) = 271$ و $f(138) = 273$ و $f(139) = 275$ و $f(140) = 277$ و $f(141) = 279$ و $f(142) = 281$ و $f(143) = 283$ و $f(144) = 285$ و $f(145) = 287$ و $f(146) = 289$ و $f(147) = 291$ و $f(148) = 293$ و $f(149) = 295$ و $f(150) = 297$ و $f(151) = 299$ و $f(152) = 301$ و $f(153) = 303$ و $f(154) = 305$ و $f(155) = 307$ و $f(156) = 309$ و $f(157) = 311$ و $f(158) = 313$ و $f(159) = 315$ و $f(160) = 317$ و $f(161) = 319$ و $f(162) = 321$ و $f(163) = 323$ و $f(164) = 325$ و $f(165) = 327$ و $f(166) = 329$ و $f(167) = 331$ و $f(168) = 333$ و $f(169) = 335$ و $f(170) = 337$ و $f(171) = 339$ و $f(172) = 341$ و $f(173) = 343$ و $f(174) = 345$ و $f(175) = 347$ و $f(176) = 349$ و $f(177) = 351$ و $f(178) = 353$ و $f(179) = 355$ و $f(180) = 357$ و $f(181) = 359$ و $f(182) = 361$ و $f(183) = 363$ و $f(184) = 365$ و $f(185) = 367$ و $f(186) = 369$ و $f(187) = 371$ و $f(188) = 373$ و $f(189) = 375$ و $f(190) = 377$ و $f(191) = 379$ و $f(192) = 381$ و $f(193) = 383$ و $f(194) = 385$ و $f(195) = 387$ و $f(196) = 389$ و $f(197) = 391$ و $f(198) = 393$ و $f(199) = 395$ و $f(200) = 397$ و $f(201) = 399$ و $f(202) = 401$ و $f(203) = 403$ و $f(204) = 405$ و $f(205) = 407$ و $f(206) = 409$ و $f(207) = 411$ و $f(208) = 413$ و $f(209) = 415$ و $f(210) = 417$ و $f(211) = 419$ و $f(212) = 421$ و $f(213) = 423$ و $f(214) = 425$ و $f(215) = 427$ و $f(216) = 429$ و $f(217) = 431$ و $f(218) = 433$ و $f(219) = 435$ و $f(220) = 437$ و $f(221) = 439$ و $f(222) = 441$ و $f(223) = 443$ و $f(224) = 445$ و $f(225) = 447$ و $f(226) = 449$ و $f(227) = 451$ و $f(228) = 453$ و $f(229) = 455$ و $f(230) = 457$ و $f(231) = 459$ و $f(232) = 461$ و $f(233) = 463$ و $f(234) = 465$ و $f(235) = 467$ و $f(236) = 469$ و $f(237) = 471$ و $f(238) = 473$ و $f(239) = 475$ و $f(240) = 477$ و $f(241) = 479$ و $f(242) = 481$ و $f(243) = 483$ و $f(244) = 485$ و $f(245) = 487$ و $f(246) = 489$ و $f(247) = 491$ و $f(248) = 493$ و $f(249) = 495$ و $f(250) = 497$ و $f(251) = 499$ و $f(252) = 501$ و $f(253) = 503$ و $f(254) = 505$ و $f(255) = 507$ و $f(256) = 509$ و $f(257) = 511$ و $f(258) = 513$ و $f(259) = 515$ و $f(260) = 517$ و $f(261) = 519$ و $f(262) = 521$ و $f(263) = 523$ و $f(264) = 525$ و $f(265) = 527$ و $f(266) = 529$ و $f(267) = 531$ و $f(268) = 533$ و $f(269) = 535$ و $f(270) = 537$ و $f(271) = 539$ و $f(272) = 541$ و $f(273) = 543$ و $f(274) = 545$ و $f(275) = 547$ و $f(276) = 549$ و $f(277) = 551$ و $f(278) = 553$ و $f(279) = 555$ و $f(280) = 557$ و $f(281) = 559$ و $f(282) = 561$ و $f(283) = 563$ و $f(284) = 565$ و $f(285) = 567$ و $f(286) = 569$ و $f(287) = 571$ و $f(288) = 573$ و $f(289) = 575$ و $f(290) = 577$ و $f(291) = 579$ و $f(292) = 581$ و $f(293) = 583$ و $f(294) = 585$ و $f(295) = 587$ و $f(296) = 589$ و $f(297) = 591$ و $f(298) = 593$ و $f(299) = 595$ و $f(300) = 597$ و $f(301) = 599$ و $f(302) = 601$ و $f(303) = 603$ و $f(304) = 605$ و $f(305) = 607$ و $f(306) = 609$ و $f(307) = 611$ و $f(308) = 613$ و $f(309) = 615$ و $f(310) = 617$ و $f(311) = 619$ و $f(312) = 621$ و $f(313) = 623$ و $f(314) = 625$ و $f(315) = 627$ و $f(316) = 629$ و $f(317) = 631$ و $f(318) = 633$ و $f(319) = 635$ و $f(320) = 637$ و $f(321) = 639$ و $f(322) = 641$ و $f(323) = 643$ و $f(324) = 645$ و $f(325) = 647$ و $f(326) = 649$ و $f(327) = 651$ و $f(328) = 653$ و $f(329) = 655$ و $f(330) = 657$ و $f(331) = 659$ و $f(332) = 661$ و $f(333) = 663$ و $f(334) = 665$ و $f(335) = 667$ و $f(336) = 669$ و $f(337) = 671$ و $f(338) = 673$ و $f(339) = 675$ و $f(340) = 677$ و $f(341) = 679$ و $f(342) = 681$ و $f(343) = 683$ و $f(344) = 685$ و $f(345) = 687$ و $f(346) = 689$ و $f(347) = 691$ و $f(348) = 693$ و $f(349) = 695$ و $f(350) = 697$ و $f(351) = 699$ و $f(352) = 701$ و $f(353) = 703$ و $f(354) = 705$ و $f(355) = 707$ و $f(356) = 709$ و $f(357) = 711$ و $f(358) = 713$ و $f(359) = 715$ و $f(360) = 717$ و $f(361) = 719$ و $f(362) = 721$ و $f(363) = 723$ و $f(364) = 725$ و $f(365) = 727$ و $f(366) = 729$ و $f(367) = 731$ و $f(368) = 733$ و $f(369) = 735$ و $f(370) = 737$ و $f(371) = 739$ و $f(372) = 741$ و $f(373) = 743$ و $f(374) = 745$ و $f(375) = 747$ و $f(376) = 749$ و $f(377) = 751$ و $f(378) = 753$ و $f(379) = 755$ و $f(380) = 757$ و $f(381) = 759$ و $f(382) = 761$ و $f(383) = 763$ و $f(384) = 765$ و $f(385) = 767$ و $f(386) = 769$ و $f(387) = 771$ و $f(388) = 773$ و $f(389) = 775$ و $f(390) = 777$ و $f(391) = 779$ و $f(392) = 781$ و $f(393) = 783$ و $f(394) = 785$ و $f(395) = 787$ و $f(396) = 789$ و $f(397) = 791$ و $f(398) = 793$ و $f(399) = 795$ و $f(400) = 797$ و $f(401) = 799$ و $f(402) = 801$ و $f(403) = 803$ و $f(404) = 805$ و $f(405) = 807$ و $f(406) = 809$ و $f(407) = 811$ و $f(408) = 813$ و $f(409) = 815$ و $f(410) = 817$ و $f(411) = 819$ و $f(412) = 821$ و $f(413) = 823$ و $f(414) = 825$ و $f(415) = 827$ و $f(416) = 829$ و $f(417) = 831$ و $f(418) = 833$ و $f(419) = 835$ و $f(420) = 837$ و $f(421) = 839$ و $f(422) = 841$ و $f(423) = 843$ و $f(424) = 845$ و $f(425) = 847$ و $f(426) = 849$ و $f(427) = 851$ و $f(428) = 853$ و $f(429) = 855$ و $f(430) = 857$ و $f(431) = 859$ و $f(432) = 861$ و $f(433) = 863$ و $f(434) = 865$ و $f(435) = 867$ و $f(436) = 869$ و $f(437) = 871$ و $f(438) = 873$ و $f(439) = 875$ و $f(440) = 877$ و $f(441) = 879$ و $f(442) = 881$ و $f(443) = 883$ و $f(444) = 885$ و $f(445) = 887$ و $f(446) = 889$ و $f(447) = 891$ و $f(448) = 893$ و $f(449) = 895$ و $f(450) = 897$ و $f(451) = 899$ و $f(452) = 901$ و $f(453) = 903$ و $f(454) = 905$ و $f(455) = 907$ و $f(456) = 909$ و $f(457) = 911$ و $f(458) = 913$ و $f(459) = 915$ و $f(460) = 917$ و $f(461) = 919$ و $f(462) = 921$ و $f(463) = 923$ و $f(464) = 925$ و $f(465) = 927$ و $f(466) = 929$ و $f(467) = 931$ و $f(468) = 933$ و $f(469) = 935$ و $f(470) = 937$ و $f(471) = 939$ و $f(472) = 941$ و $f(473) = 943$ و $f(474) = 945$ و $f(475) = 947$ و $f(476) = 949$ و $f(477) = 951$ و $f(478) = 953$ و $f(479) = 955$ و $f(480) = 957$ و $f(481) = 959$ و $f(482) = 961$ و $f(483) = 963$ و $f(484) = 965$ و $f(485) = 967$ و $f(486) = 969$ و $f(487) = 971$ و $f(488) = 973$ و $f(489) = 975$ و $f(490) = 977$ و $f(491) = 979$ و $f(492) = 981$ و $f(493) = 983$ و $f(494) = 985$ و $f(495) = 987$ و $f(496) = 989$ و $f(497) = 991$ و $f(498) = 993$ و $f(499) = 995$ و $f(500) = 997$ و $f(501) = 999$ و $f(502) = 1001$ و $f(503) = 1003$ و $f(504) = 1005$ و $f(505) = 1007$ و $f(506) = 1009$ و $f(507) = 1011$ و $f(508) = 1013$ و $f(509) = 1015$ و $f(510) = 1017$ و $f(511) = 1019$ و $f(512) = 1021$ و $f(513) = 1023$ و $f(514) = 1025$ و $f(515) = 1027$ و $f(516) = 1029$ و $f(517) = 1031$ و $f(518) = 1033$ و $f(519) = 1035$ و $f(520) = 1037$ و $f(521) = 1039$ و $f(522) = 1041$ و $f(523) = 1043$ و $f(524) = 1045$ و $f(525) = 1047$ و $f(526) = 1049$ و $f(527) = 1051$ و $f(528) = 1053$ و $f(529) = 1055$ و $f(530) = 1057$ و $f(531) = 1059$ و $f(532) = 1061$ و $f(533) = 1063$ و $f(534) = 1065$ و $f(535) = 1067$ و $f(536) = 1069$ و $f(537) = 1071$ و $f(538) = 1073$ و $f(539) = 1075$ و $f(540) = 1077$ و $f(541) = 1079$ و $f(542) = 1081$ و $f(543) = 1083$ و $f(544) = 1085$ و $f(545) = 1087$ و $f(546) = 1089$ و $f(547) = 1091$ و $f(548) = 1093$ و $f(549) = 1095$ و $f(550) = 1097$ و $f(551) = 1099$ و $f(552) = 1101$ و $f(553) = 1103$ و $f(554) = 1105$ و $f(555) = 1107$ و $f(556) = 1109$ و $f(557) = 1111$ و $f(558) = 1113$ و $f(559) = 1115$ و $f(560) = 1117$ و $f(561) = 1119$ و $f(562) = 1121$ و $f(563) = 1123$ و $f(564) = 1125$ و $f(565) = 1127$ و $f(566) = 1129$ و $f(567) = 1131$ و $f(568) = 1133$ و $f(569) = 1135$ و $f(570) = 1137$ و $f(571) = 1139$ و $f(572) = 1141$ و $f(573) = 1143$ و $f(574) = 1145$ و $f(575) = 1147$ و $f(576) = 1149$ و $f(577) = 1151$ و $f(578) = 1153$ و $f(579) = 1155$ و $f(580) = 1157$ و $f(581) = 1159$ و $f(582) = 1161$ و $f(583) = 1163$ و $f(584) = 1165$ و $f(585) = 1167$ و $f(586) = 1169$ و $f(587) = 1171$ و $f(588) = 1173$ و $f(589) = 1175$ و $f(590) = 1177$ و $f(591) = 1179$ و $f(592) = 1181$ و $f(593) = 1183$ و $f(594) = 1185$ و $f(595) = 1187$ و $f(596) = 1189$ و $f(597) = 1191$ و $f(598) = 1193$ و $f(599) = 1195$ و $f(600) = 1197$ و $f(601) = 1199$ و $f(602) = 1201$ و $f(603) = 1203$ و $f(604) = 1205$ و $f(605) = 1207$ و $f(606) = 1209$ و $f(607) = 1211$ و $f(608) = 1213$ و $f(609) = 1215$ و $f(610) = 1217$ و $f(611) = 1219$ و $f(612) = 1221$ و $f(613) = 1223$ و $f(614) = 1225$ و $f(615) = 1227$ و $f(616) = 1229$ و $f(617) = 1231$ و $f(618) = 1233$ و $f(619) = 1235$ و $f(620) = 1237$ و $f(621) = 1239$ و $f(622) = 1241$ و $f(623) = 1243$ و $f(624) = 1245$ و $f(625) = 1247$ و $f(626) = 1249$ و $f(627) = 1251$ و $f(628) = 1253$ و $f(629) = 1255$ و $f(630) = 1257$ و $f(631) = 1259$ و $f(632) = 1261$ و $f(633) = 1263$ و $f(634) = 1265$ و $f(635) = 1267$ و $f(636) = 1269$ و $f(637) = 1271$ و $f(638) = 1273$ و $f(639) = 1275$ و $f(640) = 1277$ و $f(641) = 1279$ و $f(642) = 1281$ و $f(643) = 1283$ و $f(644) = 1285$ و $f(645) = 1287$ و $f(646) = 1289$ و $f(647) = 1291$ و $f(648) = 1293$ و $f(649) = 1295$ و $f(650) = 1297$ و $f(651) = 1299$ و $f(652) = 1301$ و $f(653) = 1303$ و $f(654) = 1305$ و $f(655) = 1307$ و $f(656) = 1309$ و $f(657) = 1311$ و $f(658) = 1313$ و $f(659) = 1315$ و $f(660) = 1317$ و $f(661) = 1319$ و $f(662) = 1321$ و $f(663) = 1323$ و $f(664) = 1325$ و $f(665) = 1327$ و $f(666) = 1329$ و $f(667) = 1331$ و $f(668) = 1333$ و $f(669) = 1335$ و $f(670) = 1337$ و $f(671) = 1339$ و $f(672) = 1341$ و $f(673) = 1343$ و $f(674) = 1345$ و $f(675) = 1347$ و $f(676) = 1349$ و $f(677) = 1351$ و $f(678) = 1353$ و $f(679) = 1355$ و $f(680) = 1357$ و $f(681) = 1359$ و $f(682) = 1361$ و $f(683) = 1363$ و $f(684) = 1365$ و $f(685) = 1367$ و $f(686) = 1369$ و $f(687) = 1371$ و $f(688) = 1373$ و $f(689) = 1375$ و $f(690) = 1377$ و $f(691) = 1379$ و $f(692) = 1381$ و $f(693) = 1383$ و $f(694) = 1385$ و $f(695) = 1387$ و $f(696) = 1389$ و $f(697) = 1391$ و $f(698) = 1393$ و $f(699) = 1395$ و $f(700) = 1397$ و $f(701) = 1399$ و $f(702) = 1401$ و $f(703) = 1403$ و $f(704) = 1405$ و $f(705) = 1407$ و $f(706) = 1409$ و $f(707) = 1411$ و $f(708) = 1413$ و $f(709) = 1$

$$g(n) = a = 2f(n) - 1 \rightarrow \frac{a+1}{2} = f(n) \rightarrow \frac{1}{2} f^{-1}\left(\frac{a+1}{2}\right) = n$$

$$g^{-1}(a) = n \rightarrow g(n) = \frac{1}{2} f^{-1}\left(\frac{a+1}{2}\right) \Rightarrow a = \frac{1}{2} f^{-1}\left(\frac{a+1}{2}\right)$$

$$\frac{f^{-1}(x)}{2} = \frac{1}{2} f^{-1}\left(\frac{a+1}{2}\right)$$

$$a = 2\sqrt{n} \rightarrow D_f \in [0, +\infty), R_f \in [0, +\infty)$$

$$a = 2\sqrt{y} \Rightarrow y^2 - 2ay + a^2 = \varepsilon y \rightarrow y^2 - (2a + \varepsilon)y + a^2 = 0$$

$$y = \frac{2a + \varepsilon \pm \sqrt{4a^2 - 4(a^2 - \varepsilon a)}}{2} = a + \frac{\varepsilon}{2} \pm \sqrt{a\varepsilon}$$

از آنجا که $n+2 = 2\sqrt{n+1}$

$D_f^{-1}(a) = [0, +\infty)$
 $R_f(n)$

$a = 1 + r^n \Rightarrow$ معادله معادله $\Rightarrow$ واریان را در شرایط نامعادل

$$a = 1 + r^n = a \Rightarrow r^n < 1 \Rightarrow [a, \infty)$$

$$f^{-1}(n) > n$$

از دو طرف $f^{-1}(f(n))$
 $f \circ f^{-1}(n) > f(n) \rightarrow n > f(n) \rightarrow 0 < a + r^n \Rightarrow a = 0$
 یک جواب

$$y = a + \sqrt{a^2 + \varepsilon} \rightarrow a = y + \sqrt{y^2 + \varepsilon} \rightarrow y^2 + 2ay + y^2 = y^2 + \varepsilon \Rightarrow y + (a+1) \geq a + \varepsilon$$

$$y = \frac{1 - 2a - \sqrt{1 - 4\varepsilon a}}{2} \rightarrow a = -\frac{1}{2} \left(1 + \sqrt{1 - 4\varepsilon a} \right)$$

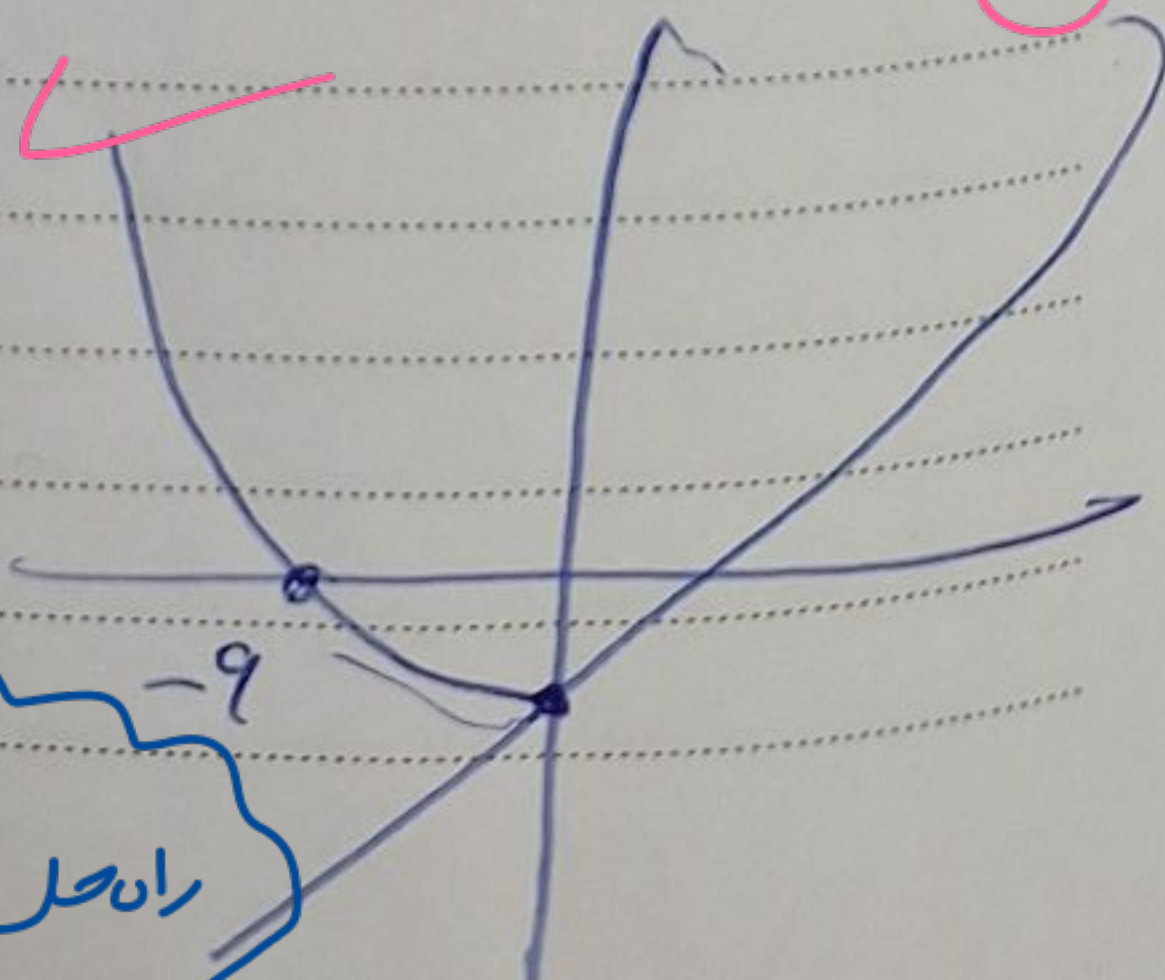
$$f(n) \xrightarrow{\text{تقریب}} f^{-1}(n) \xrightarrow{\text{تقریب}} f^{-1}(f(n)) \rightarrow g(n) = f^{-1}(f(n))$$

$$g(n) = n - c \rightarrow f^{-1}(f(n)) = n - c \xrightarrow{\text{از آنجا که}} n+2 = f(n-c)$$

$$n+2 = 2\sqrt{n-c} \rightarrow n+1 = \sqrt{n-c} \rightarrow n+1 = \sqrt{n-c}$$

نقطه تقاطع
 نقطه $(n-c, n+2)$
 جواب را بیاب

راه حل شریف تر !!



21 Nov 2022

٢٦ ربيع الثاني ١٤٤٤

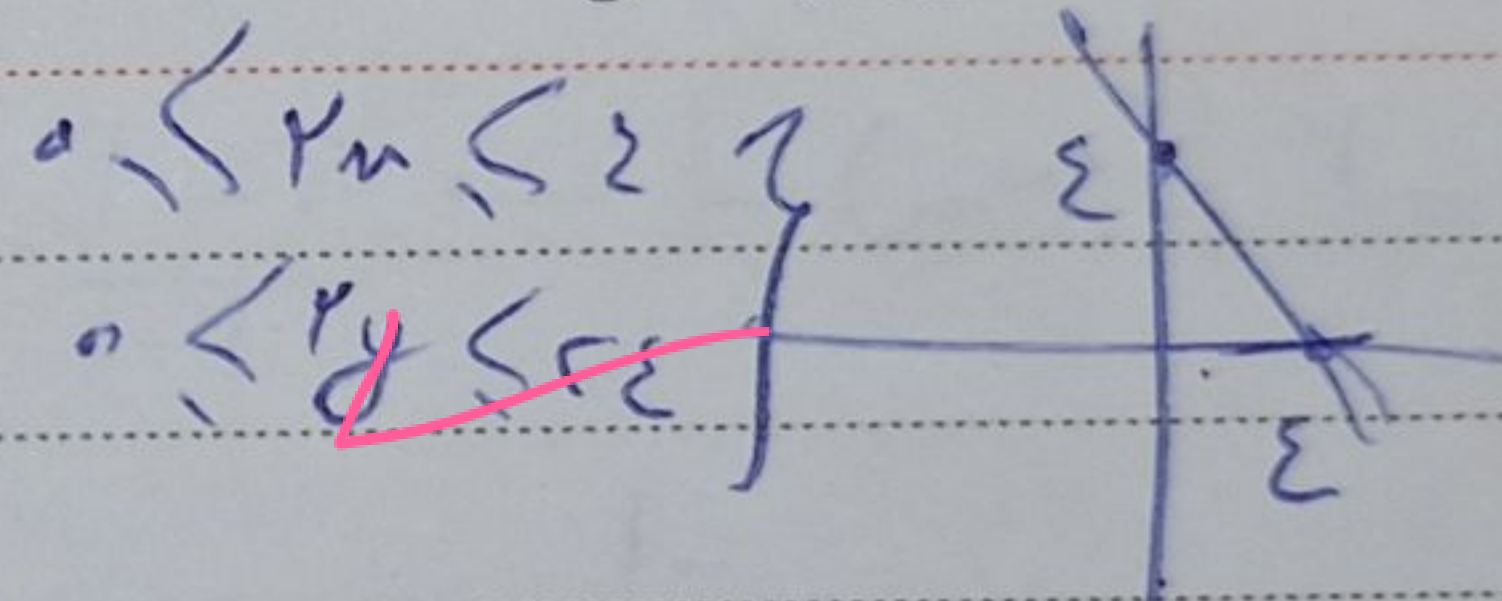
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آبان

دوشنبه

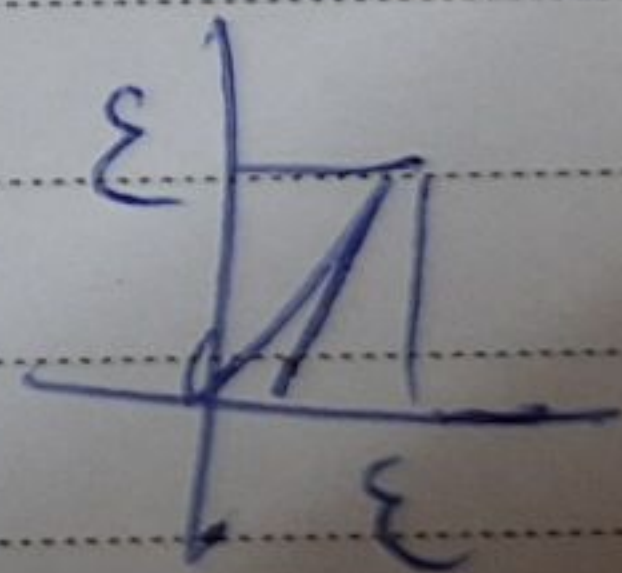
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$$\sqrt{y} \leq 1 - \sqrt{x} \rightarrow 1 - \sqrt{x} \geq 0 \rightarrow$$



$$y = f(x) = 1 - \sqrt{x} \quad x \in [0, 1]$$

$$f \circ f(x) \leq f \circ f^{-1}(x) \rightarrow x, x \in [0, 1]$$



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