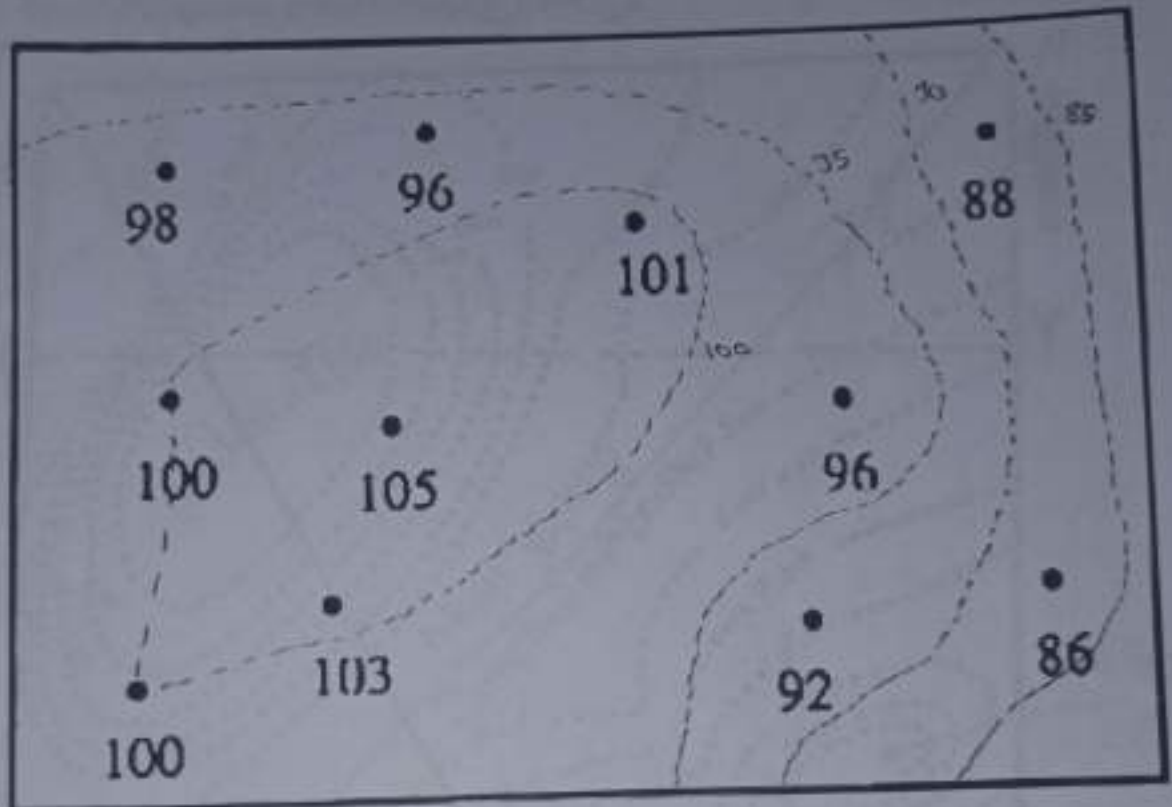


Map 1.1

Draw contour map for the elevation points shown on the map below.
Contours in meters.



C.I=5

85, 90, 95, 100

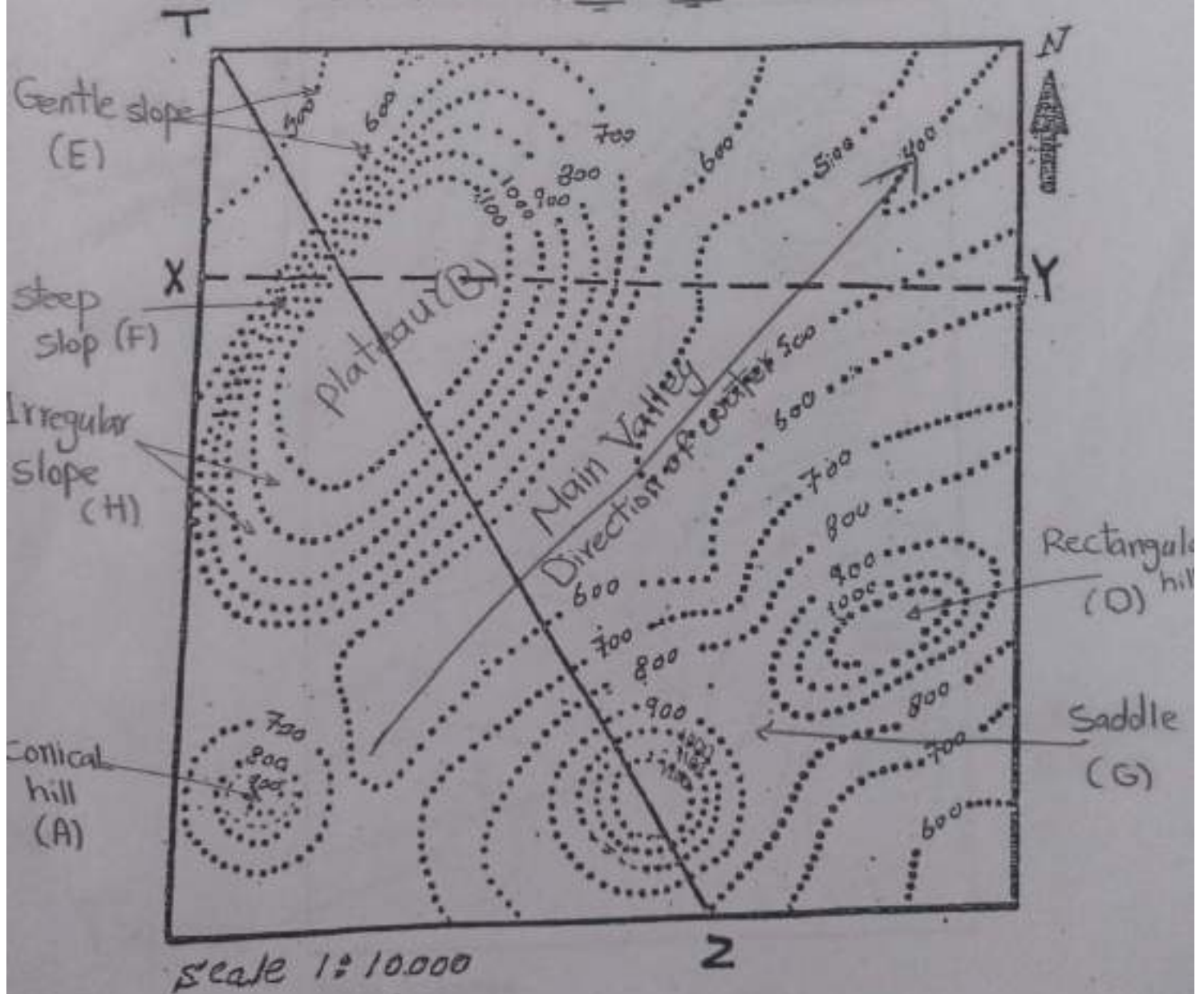
Map 1.2

1- Write down the letter of the topographic feature of the following list on the map.

A- Conical hill ✓ B- Plateau ✓ C- Main Valley D- Rectangular hill ✓ E-

Gentle slope ✓ F- Steep slope ✓ G- Saddle ✓ H- Irregular slope ✓

2- Draw a topographic profile through X-Y and T-Z ✓



* Draw a topographic profile through X-Y = 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840



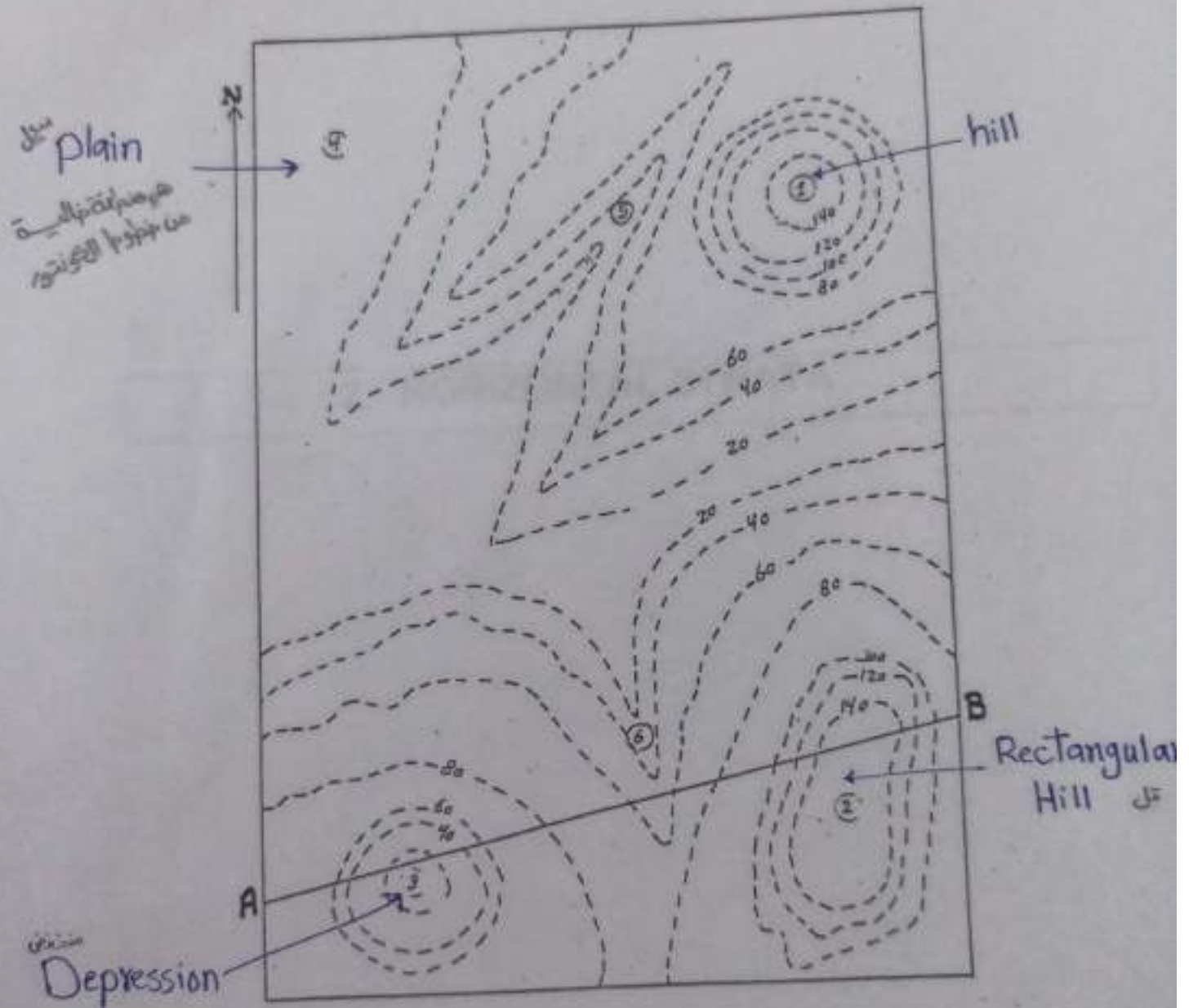
* Draw a topographic profile through T-Z . 3 ق, 234



Map 1.3

Using the following topographic map, you are required to:

- 1- Define the topographic feature for the corresponding number on the map
- 2- Draw a topographic profile through A- B



Scale 1:10000

(1)-hill

(2) Rectangular hill

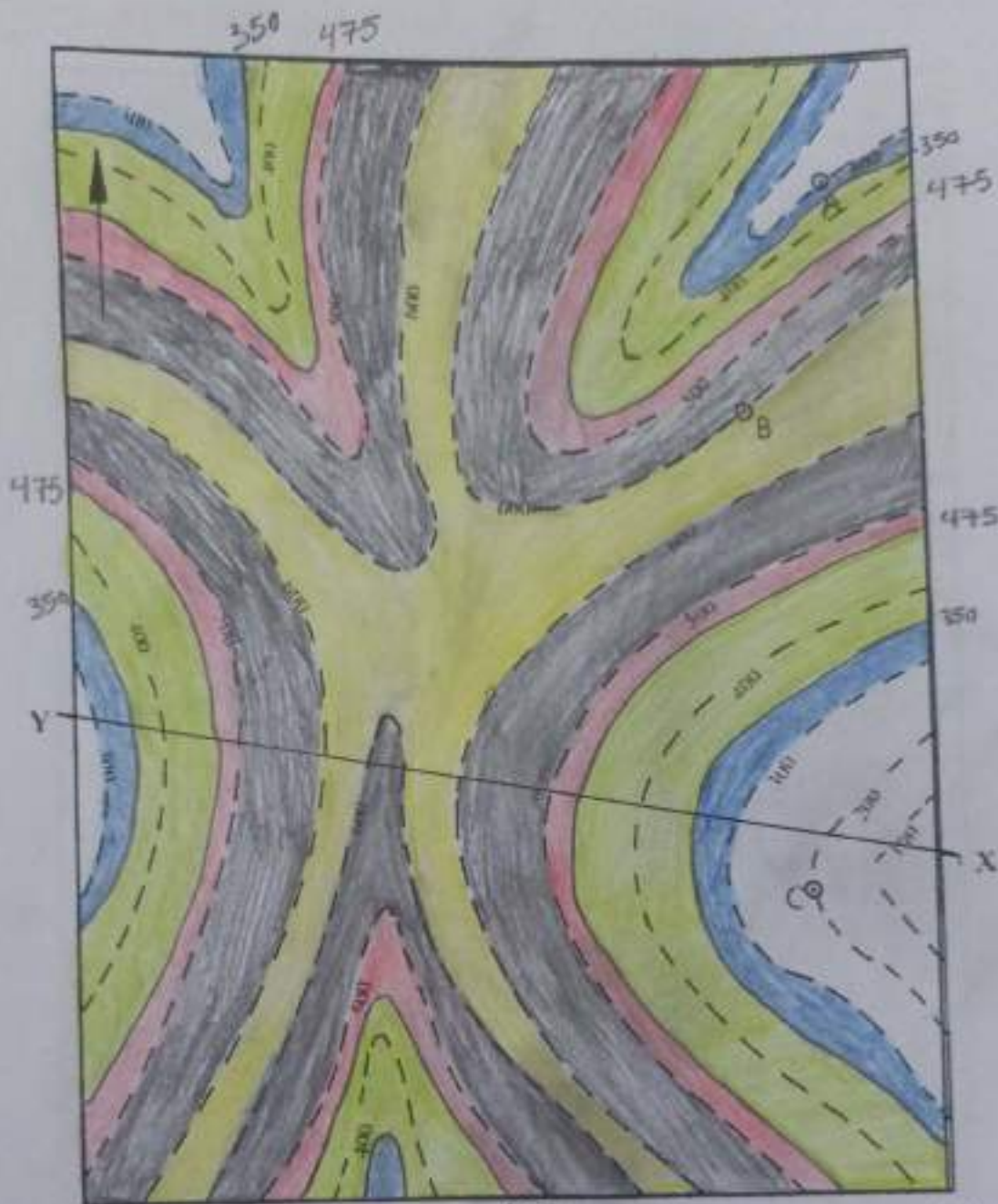
(3) Depression

(4)-plain

(5), (6) - Valley

* Draw a topographic profile through A-B " 4 p 3, 500m p





MAP 2.1: The lower surface of a conglomerate (50 m thick) appears at point A. This bed is overlain by a shale bed (125 m thick), that is in turn overlain by a 25 m thick sandstone bed then finally 100 m thick mudstone bed that is capped by a limestone bed of unknown thickness. These beds are horizontal. Draw the beds outcrop. Calculate the vertical thickness that can be drilled to reach the lower surface of the sandstone bed at points B and C. Draw a cross section along X-Y.

??	Limestone	600
100	mudstone	500
25	sandstone	475
125	Shale	350
50	conglomerate	300

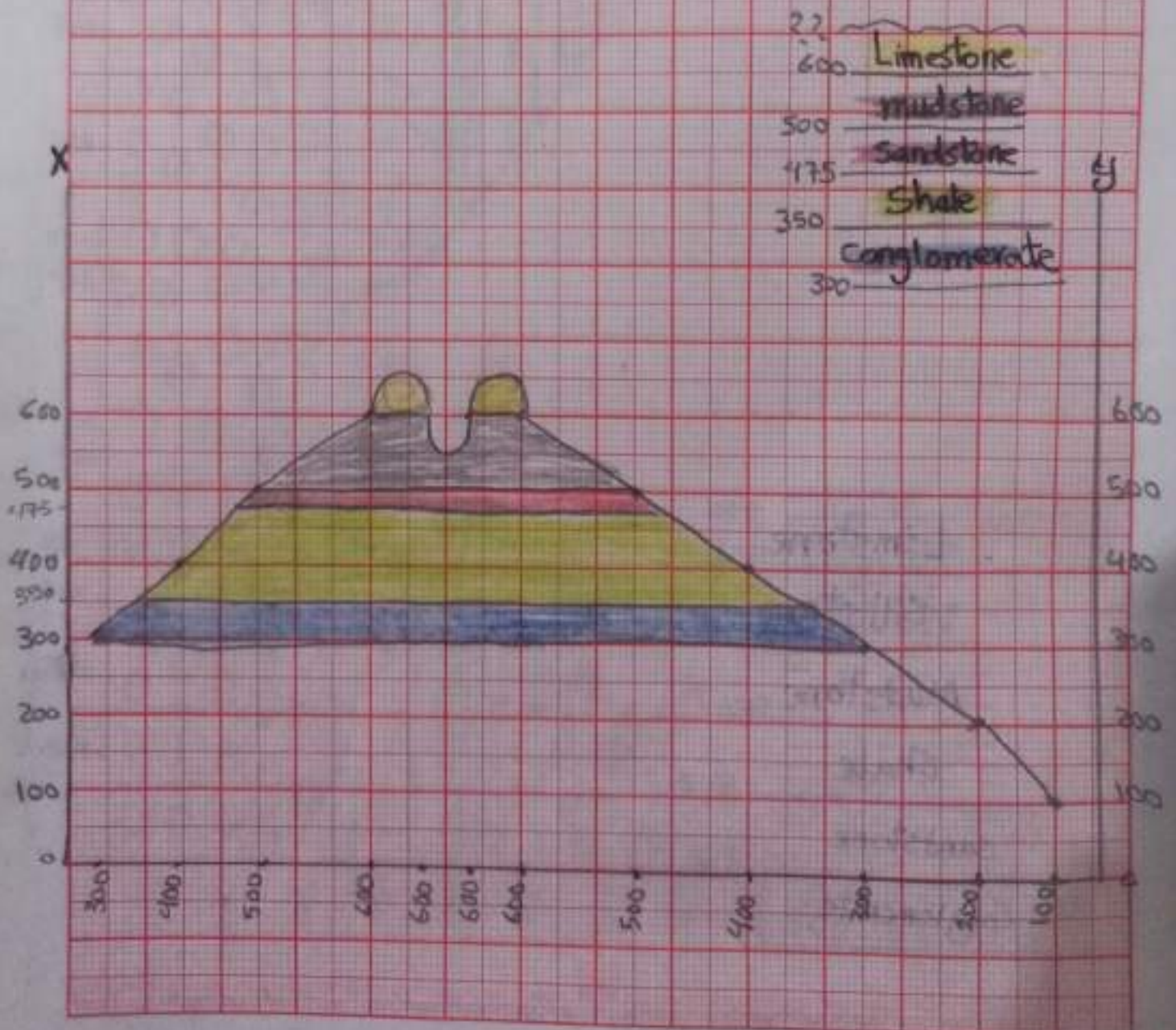
② * The vertical thickness of the sandstone at the point (B)

$$\text{الارتفاع} - \text{السطح السفلي للsandstone} = 600 - 475 = 125 \text{ m}$$

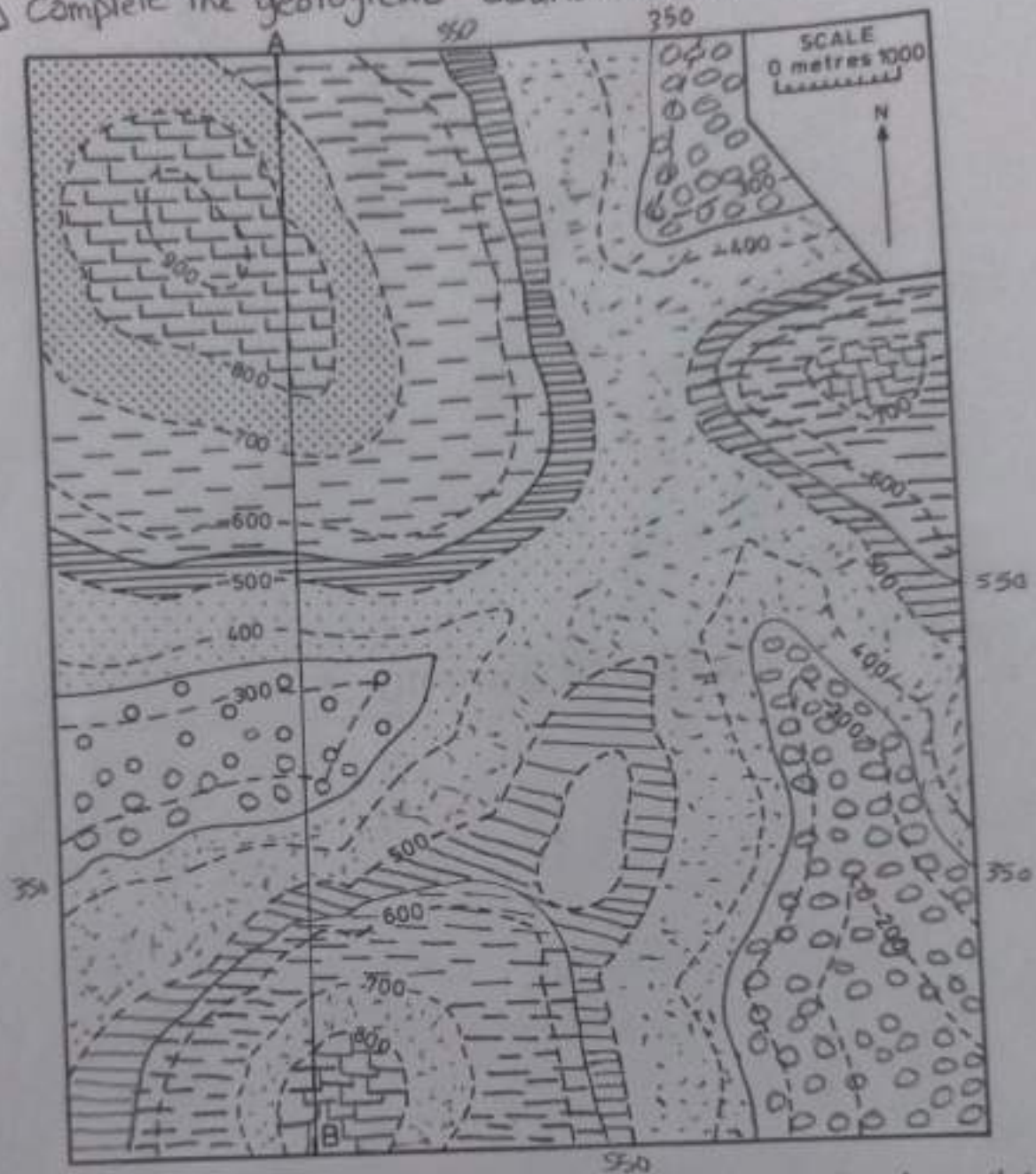
* point (C)

$$= 475 - 200 = 275 \text{ m}$$

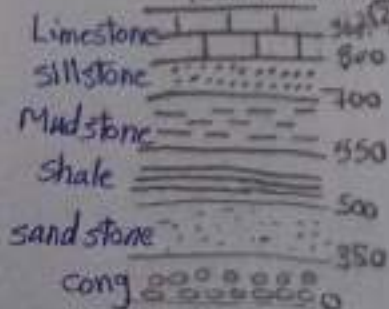
* Draw a Cross section along X-Y " 6 مَرْتَبَة "



1) Complete the geological boundaries.

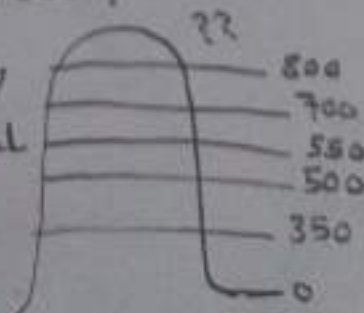


MAP 2.2: The geological outcrops are shown in the north-west corner of the map. It can be seen that the beds are horizontal as the geological boundaries coincide with, or are parallel to, the ground contour lines. Complete the geological outcrops over the whole map. How thick is each bed? Draw a vertical column showing each bed to scale. (1 cm = 100 m.) Draw a section along the line A-B. (Contours in meters.)



2) How Thick is each bed?

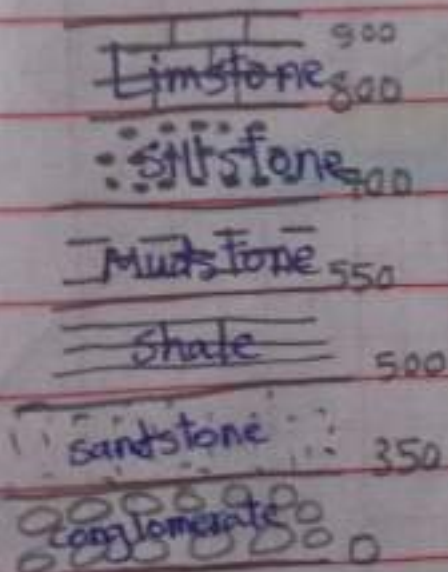
3) Draw a vertical column

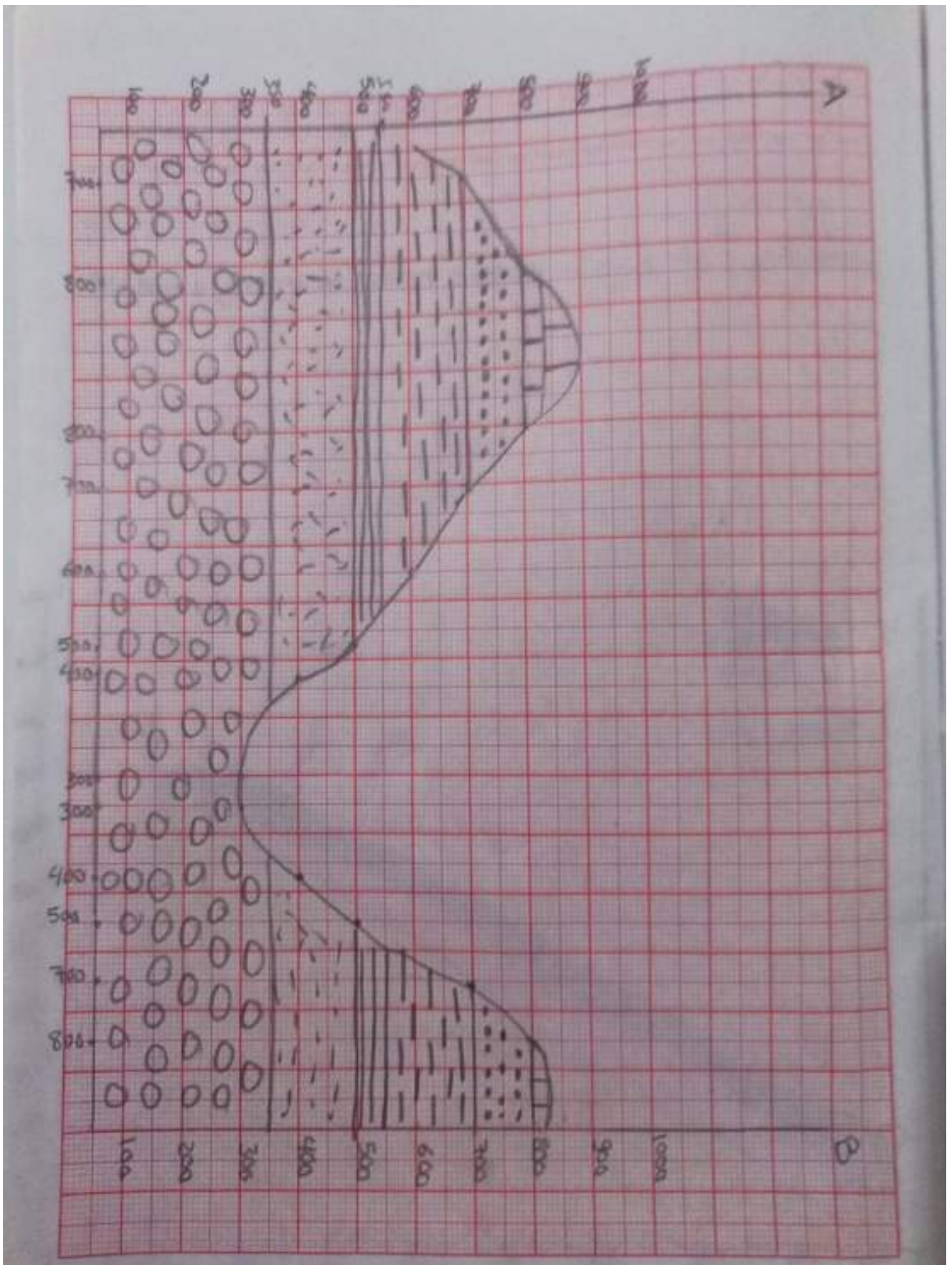


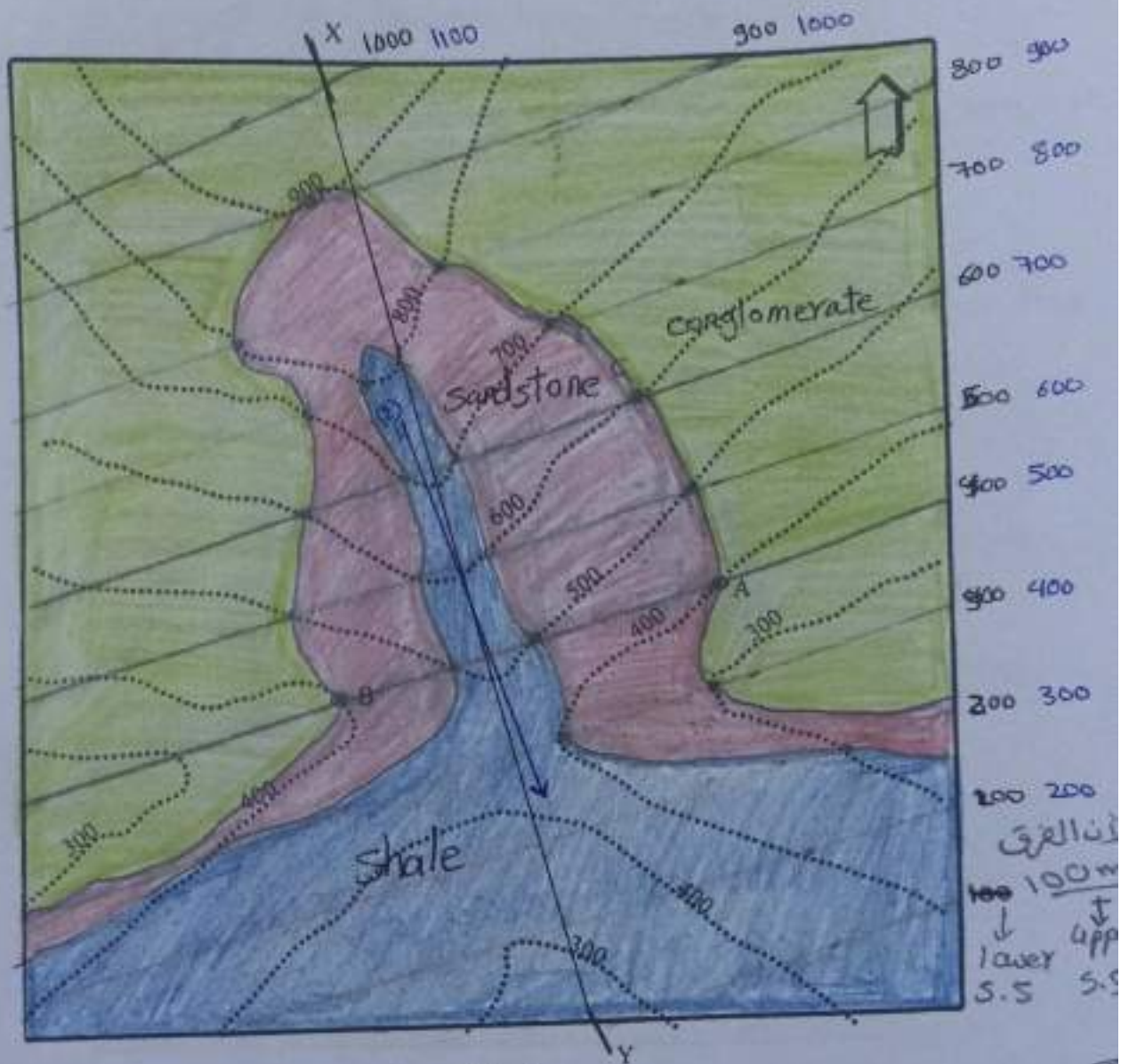
دراسة الرسم البياني

* Draw a section along the Line A-B

« ملاحظة رقم 7 »







MAP 3.1: The lower surface of a 100 m thick sandstone bed appears on point (A), (B) and (C). It is underlain by conglomerate and overlain by shale. Determine the angle and direction of the true dip. Draw the outcrops of these beds. Draw a geological cross section along X-Y. (Scale 1 cm = 200 m).

- ① توصيل المقطعين A و B على خط واحد B + A وقيمة الزاوية 400 لأنه قاطع خط الكنتور 400 "خط الكنتور الأول"
- ② رسم خط تقاطع الخط C ويكون موازي لخط القاطع B + A ويكون قيمته 600
- ③ نجد أن بينهما 500 فنجسب المسافة على مقياس الكنتور 1:100 نجد المسافة بينهما 2, 3 فنقسم على 2 نجد أن الخط العامل بينهما عند 600 المسافة الحقيقية
- بعد التوصيل لنحصل خط الكنتور
- بعد رسم خط الأساس الرسم البياني
- ④ شريط الورق الأول نقل تقاطع مع خطوط الرسم الأصلية "توصيل باليد"
- ⑤ شريط الورق الثاني نقل تقاطع مع خطوط الرسم ونعطي كل نقطة القيمة "خط الكنتور"

* Draw a geological cross section along X-Y, 3, 2, 1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000



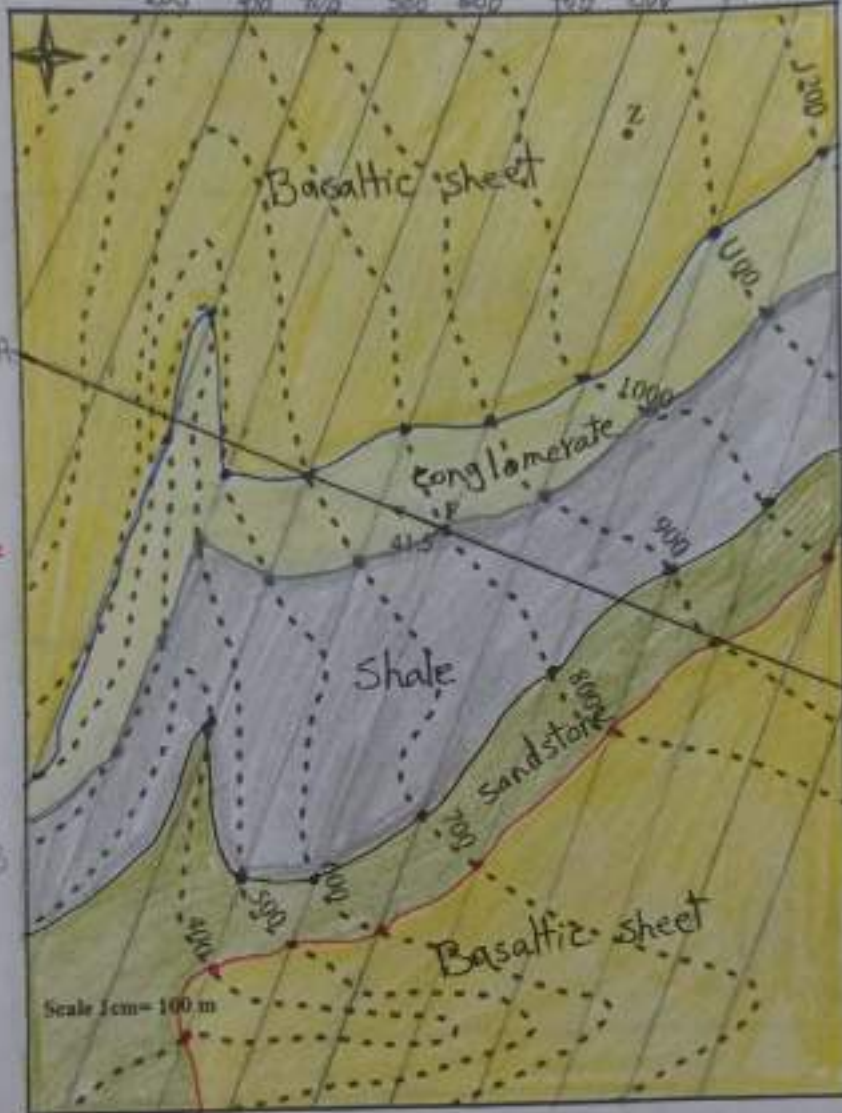
$$S.D = \frac{1}{\tan 41.5} = 1.13 \text{ cm}$$

المسافة بين كل خط 1.13
 * رسم خط مغزيب عمودي على اتجاه الميل.
 * اتجاه الميل يكون في اتجاه أعين الطبقات
 * قيم المقاييس الأتية

100	200	300	400	500	600	700
300	400	500	600	700	800	900
0	100	200	300	400	500	600
200	300	400	500	600	700	800

- upper shale
- lower shale
- upper cong
- lower sandstone

الخط التكويني الأول يتم التبر
 (2) خط التكويني



MAP 3.2: The upper surface of a dipping shale bed (200 m thick) appears at point F, the true dip direction and the dip of this bed are shown on the map. It overlies a 100 m thick sandstone bed and underlies a 100 m thick conglomerate bed. The whole succession is covered by basaltic sheet. Draw outcrops of the beds. Determine the true thickness of all beds. Calculate the depth after which the lower surface of the sandstone bed is reached at point Z. Draw a suitable cross section passing through point F.

* upper surface of shale -> point F

$$\tan \theta = \frac{C.I}{S.D} \times \text{Scale} \quad \therefore S.D = 1.13 \text{ cm}$$

* القيم نقل الزوايا في اتجاه الميل.

$$\text{true thickness} = \text{apparent} \times \cos 41.5 =$$

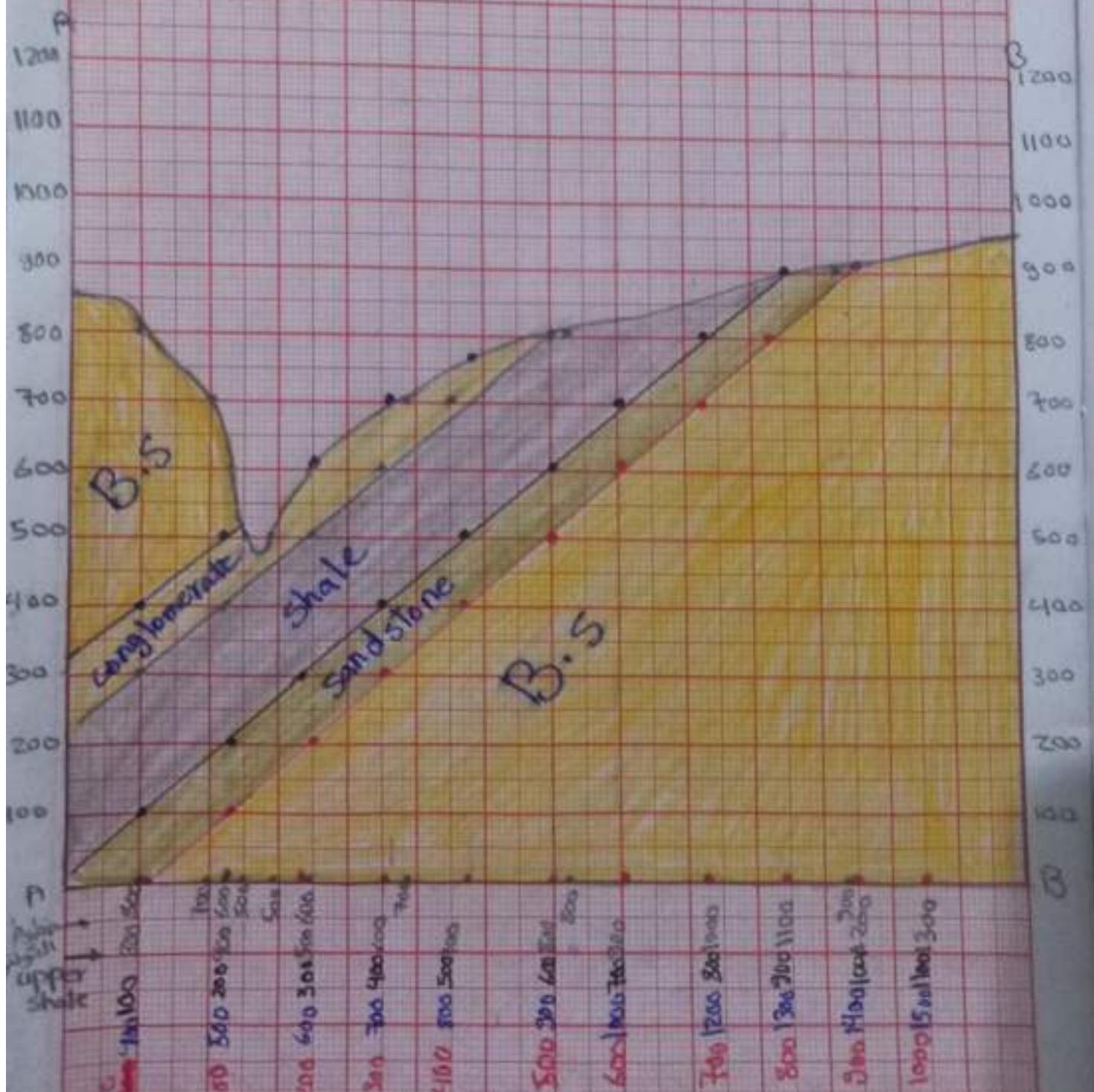
$$\text{true thickness of shale} = 200 \times \cos(41.5) = 149.79 \text{ m}$$

$$\text{true thickness of sandstone, cong} = 100 \times \cos(41.5) = 74.8 \text{ m}$$

B.S
 cong 100m
 shale 200m
 sandstone 100m
 B.S

* Draw a suitable cross section passing through point F

1:10, 1:20, 1:40

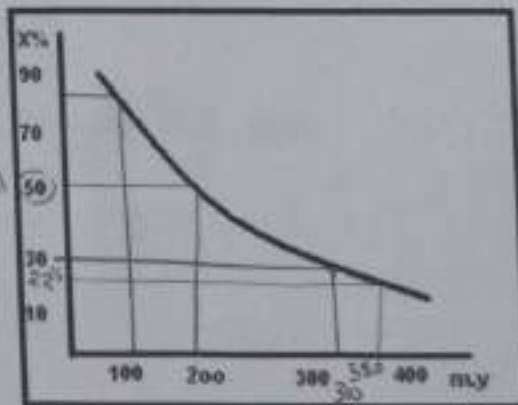


Absolute age ١-العمر المطلق

حدد عمر الصخور التي بها مواد مشعة



* تعمل بالأسطر ويؤخذ الرقم التقريبي .



Decay curve for X isotope

المرء الذي لا يرضى لـ X

ترتيب الأعراس :-

younger

17-18

B

7-13

A

1-4

schist

order

Using the previous figures and determine the following:

- a- The date of metamorphism of schist...^{تاريخ تحول الشيست} 380...m.y
- b- The date of intrusion A...^{التاريخ} 310...m.y c- The date of intrusion B...^{التاريخ} 110...m.y d- The half life of isotope x...^{النصف الحياتي} 200...m.y e- What is the age of beds 1-4...^{أقدم من 380 وأحدث من 310} younger than 380 and older than 310 f- What is the age of beds 7-13...^{أقدم من 310 وأحدث من 110} younger than 310 and older than 110 g- The oldest period of bed 17. ^{أحدث من 310} younger than 310 ☐ Non
- h- Colored the ^{عزيم التوافق} unconformities surfaces. i-

Type of structure present. X

imp * ^{تاريخ التسمية} j- Geologic history. ترتيب الأجزاء

younger

17-18

B

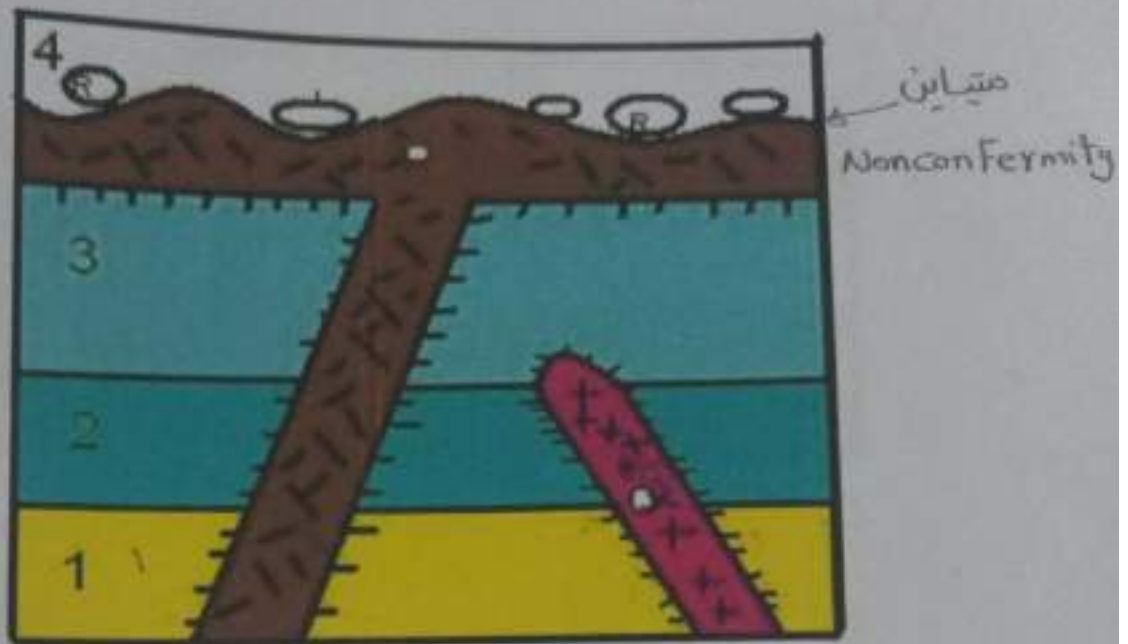
7-13

A

1-4

schist

older



Radiation percent of Q (X 40%)

16 Curve $\times$ $\frac{100}{40} = 40$ R (X 70%)

Using the following figures and determine the following:

- a- The date of intrusion Q.....250.....m.y b- The date of intrusion R.....150.....m.y c- What is the age of beds 1-3.....older than 150.....Periods d- What is the age of beds 4.....younger than 150.....Periods e- Geologic history. f- Type of structure present

ترتيب الأعمار
 Younger
 4
 R
 Q
 1-3
 Older