HW4

# 1 Create the vectors

# a) (1,2,3,...,19,20)

# b) (20,19,...,2,1)

# c) (1,2,3,...,19,20,19,18,...,2,1)

# d) (4, 6, 3) and assign it to the name tmp.

# For parts (e), (f) and (g) look at the help for the function rep.

# e) (4,6,3, 4,6,3,...,4,6,3) where there are 10 occurrences of 4.

# f) (4,6,3, 4,6,3,...,4,6,3,4) where there are 11 occurrences of 4, 10 occurrences of 6 and 10 occurrences of 3.

# g) (4,4,...,4, 6,6,...,6, 3,3,...,3) where there are 10 occurrences of 4, 20

# occurrences of 6 and 30 occurrences of 3.

#a  
(1:20)

## [1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

#b  
(20:1)

## [1] 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

#c  
c(1:20,19:1)

## [1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 19 18 17  
## [24] 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

#d  
tmp <- c(4,6,3)

# using repitition functions

#e  
rep(c(4,6,3), 10)

## [1] 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3

#f  
rep(c(4,6,3), len=31)

## [1] 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4 6 3 4

#g  
rep(c(4,6,3), c(10,20,30))

## [1] 4 4 4 4 4 4 4 4 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 3 3 3 3 3  
## [36] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3

# 2 Create a vector of the values of (e^x)cos(x) at x = 3,3.1,3.2,...,5.9,6.

#using in-buit sequence function  
x <- seq(3,6,0.1)  
exp(x)\*cos(x)

## [1] -19.884531 -22.178753 -24.490697 -26.773182 -28.969238 -31.011186  
## [7] -32.819775 -34.303360 -35.357194 -35.862834 -35.687732 -34.685042  
## [13] -32.693695 -29.538816 -25.032529 -18.975233 -11.157417 -1.362099  
## [19] 10.632038 25.046705 42.099201 61.996630 84.929067 111.061586  
## [25] 140.525075 173.405776 209.733494 249.468441 292.486707 338.564378  
## [31] 387.360340

# 3

#a  
(0.1^seq(3,36,by=3))\*(0.2^seq(1,34,by=3))

## [1] 2.000000e-04 1.600000e-09 1.280000e-14 1.024000e-19 8.192000e-25  
## [6] 6.553600e-30 5.242880e-35 4.194304e-40 3.355443e-45 2.684355e-50  
## [11] 2.147484e-55 1.717987e-60

#b  
c <- (1:25)  
2^c/c

## [1] 2.000000e+00 2.000000e+00 2.666667e+00 4.000000e+00 6.400000e+00  
## [6] 1.066667e+01 1.828571e+01 3.200000e+01 5.688889e+01 1.024000e+02  
## [11] 1.861818e+02 3.413333e+02 6.301538e+02 1.170286e+03 2.184533e+03  
## [16] 4.096000e+03 7.710118e+03 1.456356e+04 2.759411e+04 5.242880e+04  
## [21] 9.986438e+04 1.906502e+05 3.647221e+05 6.990507e+05 1.342177e+06

# 4

#a  
i <- (10:100)  
y <- i^3+4i^2  
sum(y)

## [1] 25499019+0i

#b  
i <- (1:25)  
y <- 2^i/i+3^i/i^2  
sum(y)

## [1] 2129170437

# 5 Use the function paste to create the following character vectors of length 30:

# a) ("label 1", "label 2", ....., "label 30"). Note that there is a single space between label and the number following.

# b) ("fn1", "fn2", ..., "fn30"). In this case, there is no space between fn and the number following.

#a  
paste("label",1:30)

## [1] "label 1" "label 2" "label 3" "label 4" "label 5" "label 6"   
## [7] "label 7" "label 8" "label 9" "label 10" "label 11" "label 12"  
## [13] "label 13" "label 14" "label 15" "label 16" "label 17" "label 18"  
## [19] "label 19" "label 20" "label 21" "label 22" "label 23" "label 24"  
## [25] "label 25" "label 26" "label 27" "label 28" "label 29" "label 30"

#b  
paste("fn",1:30,sep="")

## [1] "fn1" "fn2" "fn3" "fn4" "fn5" "fn6" "fn7" "fn8" "fn9" "fn10"  
## [11] "fn11" "fn12" "fn13" "fn14" "fn15" "fn16" "fn17" "fn18" "fn19" "fn20"  
## [21] "fn21" "fn22" "fn23" "fn24" "fn25" "fn26" "fn27" "fn28" "fn29" "fn30"

# 6 Execute the following lines which create two vectors of random integers which are chosen with replacement from the integers 0, 1, . . . , 999. Both vectors have length 250.

xVec <- sample(0:999, 250, replace=T)  
yVec <- sample(0:999, 250, replace=T)  
#(a)   
yVec[-1] - xVec[-length(xVec)]

## [1] -500 74 -655 180 -94 243 728 363 -194 126 -58 -516 -163 -685  
## [15] 630 -246 -444 -362 -184 -476 9 280 -392 167 -723 -146 445 4  
## [29] 8 -780 267 -129 357 -101 133 271 -38 -226 520 18 131 771  
## [43] -37 171 301 519 326 -388 -336 78 580 -676 -295 -635 80 75  
## [57] 310 425 -488 -489 -46 -126 -361 144 124 557 -209 416 -300 634  
## [71] -943 -864 239 -113 -384 -719 491 759 -185 124 218 86 78 -282  
## [85] -620 -183 202 576 6 -510 767 -866 -156 -314 -711 411 -324 228  
## [99] 157 -133 54 -761 153 -600 -378 -543 -433 -179 -545 -390 -381 112  
## [113] -111 411 370 70 -531 -339 90 441 274 317 -629 -486 -340 -293  
## [127] 645 -172 -37 -624 306 331 71 -624 399 -329 -415 29 322 -418  
## [141] -416 82 -342 -652 -179 914 -201 206 -134 68 162 -383 276 248  
## [155] 123 -293 -235 146 88 291 -542 391 117 -295 -7 -51 -461 65  
## [169] -278 426 -945 317 -636 -249 84 -19 -462 -522 177 -893 342 -345  
## [183] -180 436 -168 -457 -263 71 -185 400 -628 -454 704 -824 560 518  
## [197] 420 -20 -141 -43 452 674 820 -54 372 -273 -81 306 83 155  
## [211] 67 -234 -608 28 336 -972 131 24 801 259 -10 573 32 -593  
## [225] 769 311 104 396 183 8 295 58 704 584 50 406 -199 74  
## [239] -393 -490 195 566 56 21 -178 -79 276 -261 -407

#(b)   
sin(yVec[-length(yVec)]) / cos(xVec[-1])

## [1] 2.12547239 -0.74231197 -0.48848099 2.06037331 1.53374616  
## [6] 0.88848468 -0.18507231 0.57877563 1.13094707 -6.53384209  
## [11] -2.51735171 58.50063378 2.80456637 -2.86480182 -0.91366446  
## [16] 0.48954734 -1.27752765 0.90954204 -0.08410188 1.38982874  
## [21] -0.87971016 0.61914033 -1.00788468 0.13576921 0.06441029  
## [26] -1.07145452 -3.15007520 -1.45158473 -1.08238567 0.63444256  
## [31] -1.45353341 0.79698561 2.10983790 -5.96263693 -1.24664984  
## [36] 0.49864772 -1.14392241 -0.06408195 0.83142315 -0.93147970  
## [41] -0.22192434 0.41999537 0.84839304 -0.25830203 1.32926033  
## [46] 1.28091894 -1.00227965 -1.27666444 2.22559128 -1.07234097  
## [51] 1.53002279 -0.47041397 -0.73881713 -2.25828284 1.15246870  
## [56] 2.90062508 -0.60087469 0.68094416 -0.07170263 -46.29485248  
## [61] 0.79782692 -0.43872306 -0.28565630 -0.89843073 -4.20763510  
## [66] 0.54578495 -0.63569087 -1.22754023 1.04683419 -1.15147485  
## [71] 0.94779498 0.32572763 0.03672475 -0.25085710 2.45583298  
## [76] -1.17464040 -1.14166298 0.11166522 -0.36662122 -5.24121838  
## [81] -1.37716080 -0.80290534 0.94005127 1.01360942 4.60172199  
## [86] 0.39526615 0.90706258 0.24691235 1.11359477 1.87790422  
## [91] -1.68919201 -0.79189590 -2.12582495 0.85253469 -2.60453521  
## [96] -0.88858928 -2.65385121 -0.69529377 31.44466332 -0.52486625  
## [101] 0.81431010 -0.87801951 -0.25647171 -9.84593585 0.84953549  
## [106] 0.46765033 -0.13836832 0.81805462 -2.52061845 1.02070031  
## [111] -1.02196280 0.98833269 3.13845951 1.30201405 2.04452743  
## [116] 9.01961911 -0.20262859 -1.63122766 0.37839700 0.66229477  
## [121] 1.14541561 16.10043161 -0.90915058 1.48165585 -1.67418598  
## [126] -1.08423526 -0.16262805 -5.19987920 0.19831546 -5.70595441  
## [131] -4.47977035 0.40407382 -0.43191030 -1.41754646 -2.77578222  
## [136] -1.35683483 -2.01276617 3.12633959 0.91363949 -6.08697347  
## [141] 0.04253489 0.42456096 1.99645816 7.29534005 -0.88010668  
## [146] -4.29548576 12.42668359 1.02642664 -0.83626145 -0.71017408  
## [151] 0.81265535 -1.20055922 0.33915148 0.27368816 0.66141570  
## [156] 1.43389869 0.53712066 1.09561845 4.95583824 0.67169321  
## [161] -3.31012633 1.05318294 -0.29898800 -0.72043613 -1.30896608  
## [166] 0.99094644 -0.92468319 -0.29335034 0.52390631 -0.98924189  
## [171] 0.87670240 -1.06647800 -0.30410852 0.98786377 -3.23157914  
## [176] 0.86862759 2.16403671 0.28338323 -0.63461727 2.51739103  
## [181] 1.01394581 6.47777046 6.26238507 -0.52678027 -3.82464156  
## [186] 1.45281213 0.11923322 -3.16684055 0.93476464 0.99936116  
## [191] 0.51286403 -0.58973620 -0.28308192 217.81512883 -0.04148866  
## [196] 0.70493684 0.19024685 -1.74886153 -0.80857038 -1.38365608  
## [201] -0.87181285 -2.49457478 4.63331966 -2.59931455 -5.87314412  
## [206] -0.17077924 -1.03888200 -10.91124864 1.26792688 0.30047930  
## [211] 1.02852947 1.15945018 -1.51642839 -3.64978431 -0.98927427  
## [216] 1.00527034 74.97847438 1.00692341 1.63561046 -0.78652995  
## [221] 0.10258243 0.51406891 0.76270182 1.61419941 -6.29190380  
## [226] -3.01419772 -2.25050101 1.16579956 -1.70346638 19.96876704  
## [231] -0.87696392 0.98609645 -1.20213111 0.03816512 -0.99231037  
## [236] -0.12537184 -0.91959410 0.79489711 14.84346722 -0.28721865  
## [241] 1.21957633 0.91525622 -0.24785022 1.78973914 0.24736076  
## [246] 1.02771644 0.98463495 -0.62965777 -0.71766648

#(c)   
xVec[-c(249,250)] + 2\*xVec[-c(1,250)]-xVec[-c(1,2)]

## [1] 1589 2667 557 649 804 207 -154 500 936 1265 1515 1229 2425 849  
## [15] 1001 977 1025 428 1879 1920 427 1112 -167 769 2269 1337 1365 98  
## [29] 1514 2071 572 1113 1200 -93 367 1424 2668 422 592 1812 650 648  
## [43] 136 660 842 325 1437 2363 1328 -517 1338 857 1710 1682 1685 2044  
## [57] 279 688 1519 537 1434 1930 1345 684 -183 1057 328 1850 297 1223  
## [71] 2521 701 883 700 2034 1721 -100 1610 1737 -198 800 1119 399 1649  
## [85] 2072 427 233 161 2234 398 1785 935 48 1753 1204 1169 1098 714  
## [99] 1766 177 1253 1210 1765 763 1954 1185 1136 1387 1060 1499 -6 947  
## [113] 1286 1525 -168 1573 1911 618 -177 1503 -74 864 1902 1374 2363 1391  
## [127] 321 459 1837 563 -36 945 2478 621 13 1010 2136 429 519 1057  
## [141] 696 505 1783 1621 -190 669 728 1708 1028 1208 2505 713 839 8  
## [155] 300 688 1687 1614 337 1475 1043 -111 527 38 1405 1993 399 1090  
## [169] 665 1877 1459 1442 1126 732 1254 1829 1956 -240 1389 1288 1682 1849  
## [183] 1230 -114 1390 2214 771 1192 775 861 2299 182 1569 1345 650 688  
## [197] 504 -77 1649 1552 753 -115 609 111 1275 628 1112 1444 78 225  
## [211] 1174 2036 458 200 1901 1422 2054 118 501 2299 671 188 1611 1024  
## [225] -2 87 454 1509 399 1250 528 430 459 408 500 402 1327 1058  
## [239] 2445 811 484 377 -727 1409 1931 416 42 1422

#or, for an answer which works whatever the length of xVec,  
xVecLen <- length(xVec)  
xVec[-c(xVecLen-1,xVecLen)] + 2\*xVec[-c(1,xVecLen)] - xVec[-c(1,2)]

## [1] 1589 2667 557 649 804 207 -154 500 936 1265 1515 1229 2425 849  
## [15] 1001 977 1025 428 1879 1920 427 1112 -167 769 2269 1337 1365 98  
## [29] 1514 2071 572 1113 1200 -93 367 1424 2668 422 592 1812 650 648  
## [43] 136 660 842 325 1437 2363 1328 -517 1338 857 1710 1682 1685 2044  
## [57] 279 688 1519 537 1434 1930 1345 684 -183 1057 328 1850 297 1223  
## [71] 2521 701 883 700 2034 1721 -100 1610 1737 -198 800 1119 399 1649  
## [85] 2072 427 233 161 2234 398 1785 935 48 1753 1204 1169 1098 714  
## [99] 1766 177 1253 1210 1765 763 1954 1185 1136 1387 1060 1499 -6 947  
## [113] 1286 1525 -168 1573 1911 618 -177 1503 -74 864 1902 1374 2363 1391  
## [127] 321 459 1837 563 -36 945 2478 621 13 1010 2136 429 519 1057  
## [141] 696 505 1783 1621 -190 669 728 1708 1028 1208 2505 713 839 8  
## [155] 300 688 1687 1614 337 1475 1043 -111 527 38 1405 1993 399 1090  
## [169] 665 1877 1459 1442 1126 732 1254 1829 1956 -240 1389 1288 1682 1849  
## [183] 1230 -114 1390 2214 771 1192 775 861 2299 182 1569 1345 650 688  
## [197] 504 -77 1649 1552 753 -115 609 111 1275 628 1112 1444 78 225  
## [211] 1174 2036 458 200 1901 1422 2054 118 501 2299 671 188 1611 1024  
## [225] -2 87 454 1509 399 1250 528 430 459 408 500 402 1327 1058  
## [239] 2445 811 484 377 -727 1409 1931 416 42 1422

#(d)   
sum(exp(-xVec[-1])/(xVec[-length(xVec)]+10))

## [1] 0.0009182001

# 7

xVec <- sample(0:999, 250, replace=T)  
yVec <- sample(0:999, 250, replace=T)  
#(a)   
yVec[yVec>600]

## [1] 788 742 787 769 880 725 925 739 918 707 753 725 789 908 692 745 898  
## [18] 871 854 741 673 939 712 623 805 633 883 930 694 852 757 940 739 712  
## [35] 713 801 958 804 943 846 775 862 784 761 970 764 702 945 703 958 630  
## [52] 709 994 644 909 726 739 823 751 790 626 945 804 975 789 958 959 607  
## [69] 667 731 868 874 704 628 731 639 842 736 890 676 737 733 826 673 662  
## [86] 859 893 653 718 902 944 768 739 654 810 727 949 694 670 777 992 656  
## [103] 921 952 627

#(b)   
(1:length(yVec))[yVec>600] #or which

## [1] 3 4 8 9 10 13 14 17 24 26 30 32 33 38 41 43 44  
## [18] 49 51 53 54 57 60 61 62 63 65 68 71 72 74 75 77 82  
## [35] 84 85 86 88 90 91 93 95 96 97 98 100 101 108 110 112 114  
## [52] 115 116 117 118 119 120 121 122 132 137 139 141 143 144 145 151 152  
## [69] 154 156 158 159 164 167 172 173 176 178 182 187 189 192 195 196 197  
## [86] 198 201 208 210 213 214 219 222 224 226 228 230 235 238 241 242 244  
## [103] 245 246 247

(yVec>600)

## [1] FALSE FALSE TRUE TRUE FALSE FALSE FALSE TRUE TRUE TRUE FALSE  
## [12] FALSE TRUE TRUE FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE  
## [23] FALSE TRUE FALSE TRUE FALSE FALSE FALSE TRUE FALSE TRUE TRUE  
## [34] FALSE FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE TRUE TRUE  
## [45] FALSE FALSE FALSE FALSE TRUE FALSE TRUE FALSE TRUE TRUE FALSE  
## [56] FALSE TRUE FALSE FALSE TRUE TRUE TRUE TRUE FALSE TRUE FALSE  
## [67] FALSE TRUE FALSE FALSE TRUE TRUE FALSE TRUE TRUE FALSE TRUE  
## [78] FALSE FALSE FALSE FALSE TRUE FALSE TRUE TRUE TRUE FALSE TRUE  
## [89] FALSE TRUE TRUE FALSE TRUE FALSE TRUE TRUE TRUE TRUE FALSE  
## [100] TRUE TRUE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE TRUE  
## [111] FALSE TRUE FALSE TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE  
## [122] TRUE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE FALSE TRUE  
## [133] FALSE FALSE FALSE FALSE TRUE FALSE TRUE FALSE TRUE FALSE TRUE  
## [144] TRUE TRUE FALSE FALSE FALSE FALSE FALSE TRUE TRUE FALSE TRUE  
## [155] FALSE TRUE FALSE TRUE TRUE FALSE FALSE FALSE FALSE TRUE FALSE  
## [166] FALSE TRUE FALSE FALSE FALSE FALSE TRUE TRUE FALSE FALSE TRUE  
## [177] FALSE TRUE FALSE FALSE FALSE TRUE FALSE FALSE FALSE FALSE TRUE  
## [188] FALSE TRUE FALSE FALSE TRUE FALSE FALSE TRUE TRUE TRUE TRUE  
## [199] FALSE FALSE TRUE FALSE FALSE FALSE FALSE FALSE FALSE TRUE FALSE  
## [210] TRUE FALSE FALSE TRUE TRUE FALSE FALSE FALSE FALSE TRUE FALSE  
## [221] FALSE TRUE FALSE TRUE FALSE TRUE FALSE TRUE FALSE TRUE FALSE  
## [232] FALSE FALSE FALSE TRUE FALSE FALSE TRUE FALSE FALSE TRUE TRUE  
## [243] FALSE TRUE TRUE TRUE TRUE FALSE FALSE FALSE

#(c)   
xVec[yVec>600]

## [1] 351 335 428 816 974 626 329 698 515 190 818 476 217 668 450 80 411  
## [18] 276 394 450 815 682 296 10 114 136 342 983 768 911 848 857 477 743  
## [35] 454 443 105 165 388 560 893 948 442 812 618 82 325 189 274 924 795  
## [52] 785 696 551 982 234 694 63 799 309 995 280 297 169 230 925 584 526  
## [69] 177 935 488 557 287 589 449 254 14 750 202 685 464 84 384 923 318  
## [86] 550 902 829 708 602 887 314 604 82 695 687 763 491 126 657 616 565  
## [103] 690 814 495

#(d)   
sqrt(abs(xVec-mean(xVec)))

## [1] 20.3828359 16.5993976 11.7277449 12.3911259 12.1053707 6.5924199  
## [7] 22.0576517 7.7807455 18.0958559 22.0331568 5.0457903 17.3913772  
## [13] 11.7243337 12.6309145 21.2023584 21.2729876 14.4727330 18.8271081  
## [19] 10.7916634 16.3260528 21.3199437 16.6595318 7.7162167 5.1439285  
## [25] 14.9150930 17.2783101 14.9150930 18.9878909 17.1038007 18.1510330  
## [31] 6.2080593 3.5411862 16.4784708 19.3767902 20.9871389 13.7280734  
## [37] 20.6509080 13.3962681 13.5447407 21.1787629 6.2080593 10.5138005  
## [43] 20.2123724 8.8056800 20.7735409 17.2493478 11.8936958 21.4368841  
## [49] 14.5787517 21.1551412 9.7231682 18.6424247 6.2080593 18.0682041  
## [55] 14.9846588 9.6674712 13.9089899 21.3901847 13.2083307 13.8758784  
## [61] 21.8755571 19.3530359 18.7760486 1.8601075 12.1053707 22.2813824  
## [67] 22.1914398 22.2364566 12.7459798 18.3994565 16.7170572 20.5538318  
## [73] 4.4113490 18.9594304 19.1953119 20.0633995 3.3970576 18.1510330  
## [79] 16.5366260 9.2444578 19.7114180 15.9518024 18.4786363 5.8770741  
## [85] 6.7483331 19.5841773 19.7853481 17.9872177 22.0784963 10.0269636  
## [91] 8.4534017 15.0485880 20.1111909 20.5314393 21.4350181 6.8220232  
## [97] 17.9849937 11.3780490 11.7703016 20.1628371 12.7882759 11.0245181  
## [103] 13.5447407 10.6047159 6.1204575 13.9089899 22.4824376 17.3072239  
## [109] 20.5051213 14.6471840 16.9274924 20.8676784 14.9150930 17.5059990  
## [115] 17.2180138 14.4034718 7.9031639 22.2139596 15.9543098 14.3338760  
## [121] 20.6286209 17.6198751 19.4283298 17.7352756 2.1118712 13.6916033  
## [127] 10.8876076 10.8378965 9.5634722 10.5574618 10.2205675 13.3992537  
## [133] 15.9204271 21.5763760 9.5152509 19.6351725 22.5046662 14.9150930  
## [139] 14.4409141 20.6024270 13.8397977 19.5841773 17.8756818 16.0791791  
## [145] 20.8916251 6.9613217 16.8683135 19.7873697 20.3602554 17.0428871  
## [151] 9.7703634 6.1204575 17.6765381 17.6504957 19.4303886 21.1296001  
## [157] 5.5190579 0.7348469 8.2740558 17.4774140 3.6687873 14.3017481  
## [163] 15.3772559 14.1964784 13.7644470 8.2788888 10.0229736 21.1551412  
## [169] 14.5444147 15.4123327 21.3901847 6.2880840 15.3146988 2.7313001  
## [175] 7.5802375 21.7839390 18.2060430 16.1697248 14.4409141 6.6678332  
## [181] 15.8259281 16.9274924 12.2253834 9.4053176 22.0349722 4.5321077  
## [187] 14.0164189 2.9086079 4.9537864 18.6692260 18.6670833 20.1131798  
## [193] 20.4093116 9.8721831 10.2244804 20.8437041 13.0590964 7.8396428  
## [199] 13.1734582 5.9548300 20.3337158 16.8362704 14.8505892 5.3347915  
## [205] 21.9440197 20.4826756 8.2788888 18.4515582 8.5123440 14.8141824  
## [211] 14.9846588 13.8369072 10.6517604 19.9614629 14.5787517 18.8005319  
## [217] 9.8762341 10.9334350 13.2113587 17.2180138 18.5617887 10.7452315  
## [223] 15.5711271 20.1628371 17.8756818 14.3687160 18.9351525 14.0875832  
## [229] 15.4770798 16.5668343 9.5152509 17.6198751 18.2060430 2.9086079  
## [235] 1.5684387 4.9457052 11.6816095 19.0404832 20.4826756 17.4487822  
## [241] 12.9792142 11.2898184 15.0179892 8.7441409 14.1936606 18.0405100  
## [247] 2.5416530 16.0791791 19.8881874 22.1463315

#(e)   
sum( yVec>max(yVec)-200 )

## [1] 44

#(f)   
sum(xVec%%2==0)

## [1] 133

#(g)   
xVec[order(yVec)]

## [1] 909 420 315 497 398 663 103 799 378 264 2 251 793 801 97 580 450  
## [18] 284 263 150 429 508 369 711 31 93 537 742 492 111 677 864 280 818  
## [35] 739 100 420 3 574 202 711 731 342 517 586 820 67 514 779 866 174  
## [52] 725 277 682 391 715 502 601 981 762 23 211 36 672 144 577 532 711  
## [69] 249 772 230 7 880 74 398 39 561 141 638 929 169 105 785 370 794  
## [86] 268 913 994 678 69 41 600 605 524 72 582 34 791 493 128 276 86  
## [103] 526 979 625 630 672 513 546 606 140 680 497 904 820 213 191 222 676  
## [120] 519 31 367 842 69 496 976 837 264 204 533 29 350 57 41 468 196  
## [137] 651 915 843 985 40 830 711 593 130 526 10 995 495 589 795 136 254  
## [154] 551 829 82 565 318 177 126 815 923 685 450 768 491 325 274 287 190  
## [171] 785 296 743 454 708 626 476 234 687 935 449 84 750 464 698 477 694  
## [188] 604 450 335 80 799 818 848 812 82 314 816 893 657 442 428 351 217  
## [205] 230 309 443 165 297 114 695 63 384 14 560 911 394 550 948 488 276  
## [222] 557 974 342 202 902 411 602 668 982 515 690 329 983 682 857 388 887  
## [239] 189 280 763 814 105 924 925 584 618 169 616 696

#(h)   
yVec[c(T,F,F)]

## [1] 431 742 29 880 725 236 349 231 271 374 57 122 532 562 745 454 871  
## [18] 302 498 75 623 112 211 60 63 380 215 712 801 804 846 184 761 764  
## [35] 251 204 0 958 709 909 823 198 318 347 104 22 945 312 958 49 959  
## [52] 667 463 323 201 4 202 731 405 736 140 266 676 408 351 673 4 276  
## [69] 279 653 28 944 204 313 164 810 275 23 694 670 777 656 627 387

# 8

1+sum(cumprod(seq(2,38,b=2)/seq(3,39,b=2)))

## [1] 6.976346