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Problem. Take the following functions and arrange them in ascending order of growth rate. Explain

the suggested ordering.

il 9 7 1092 10

1,8,7

or 9 = 1032 10 & b > 2.102.3.105. n

or a = log 2 10 6 b = 2.log 3.log , A & c > log 2 h

assuming a, b, and c are greater than O

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= 0 ((los, n)2)
             \log_2^2 n
                              = \frac{\log_2 z^h}{\log_2 \log} = N \cdot \frac{l}{\log_2 \log} = O(h)
            \log_{10} 2^n
           \log_2 n^3
                              = 0 (log , h)
           \log_2^2 n^n
                             = 0 ((n/og = n)2)
          \log_2^2 n + 2n
                                = (n)
                           = 0 (log n)
          \log_{10}(10n)
7 \operatorname{alog_{10}}^{2} n + b \log_{10} n + c = \Theta\left(\left(\frac{\log_{10} h}{\log_{10} \log_{10}}\right)^{2}\right) = \Theta\left(\log_{10} h\right)^{2}
        \log_2^2(n+2n)
                            = 0 ((log n)2)
                                                                      O(log n) < O(log 2 n) < O(n) < O(n2. log 2 n)
STOUPS
0 ( log 2 n)
                                         2) \frac{\log_2 z^2}{\log_2 \log_2 10} = \frac{1}{\log_2 10} M if \log_2 \frac{2}{\log_2 10}
  1) (los, n)2
  7) = (log 2 10)2 (log 2 n)2
                                         5) (0g2n+2n
                                                                      6,3,7,1,8,2,5,4
                                                2 h > 1/102.10 h
  8) (105, 3n)2
                                                                      if 9 = 102 10 & b < 2.102 3.105 n
                                                                      or a = lose 10 b = 2.lose 3.logen & c < log 2 h
  = (log 3+109 n)2
                                                 .. 5 > 2
  = 10923+2.10923.10924+1092n
                                     0 (los , n)
                                                                        6,3, 1,7,8, 2,5,4
                                                                       if 9 7 1092 10
                                       3) 3 · 105 2 n
  log. 3n > log 2 n
                                       6) log 2 (10 m) . log 10
                                                                       or 9 = 100,2 10 & b > 2.100, 3.105, n
   : 8 > 1
                                                                       or a = log 2 10 6 b = 2.log 3.log , h & c > log 2 h
   if a < 109 2 10
                                          log 10 (10 n) c log 2 h3
                                       ∴ 3 > 6
      7,1,8
                                                                        6,3,1,8,7,2,5,4
   if q = 102 10 bb < 2.102 3.105 n
   or a = log 10 b b = 2.log 3.log 1 b C < log 2 h
       1,7,8
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