

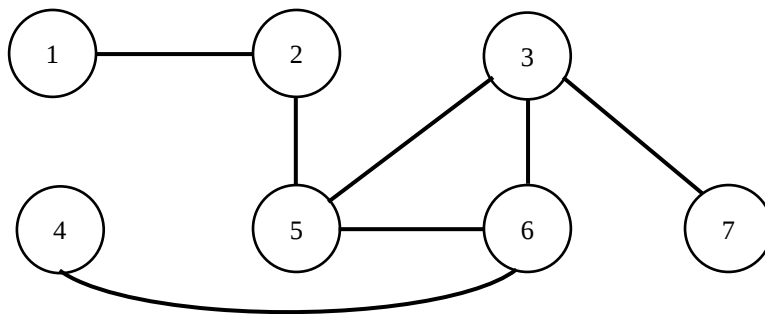
1. (25 Points) Rank the following functions from lowest to highest asymptotic growth rate.

- 1) n
- 2) e^n
- 3) $\sqrt{n}$
- 4) $n \ln(n)$
- 5) n^2
- 6) $\ln(n)$

Write your answer as a permutation of the set $\{1, 2, 3, 4, 5, 6\}$, giving the corresponding line numbers of the above functions in the required order (left to right, slowest growing function to fastest growing function.) No justifications are required.

Solution: 6 3 1 4 5 2

2. (25 Points) Run BFS on the following graph with $s = 4$ as source. Run BFS on the following graph with $s = 4$ as source. Process adjacency lists in loop 12-17 of the [BFS algorithm](#) by increasing labels.



Give the parent and distance attributes for each vertex. (Type the missing rows in the table below.)

Vertex:	1	2	3	4	5	6	7
Parent:	2	5	6	nil	6	4	3
Distance:	4	3	2	0	2	1	3

Give the vertices in the order that they enter the FIFO queue.

Queue: 4 6 3 5 7 2 1