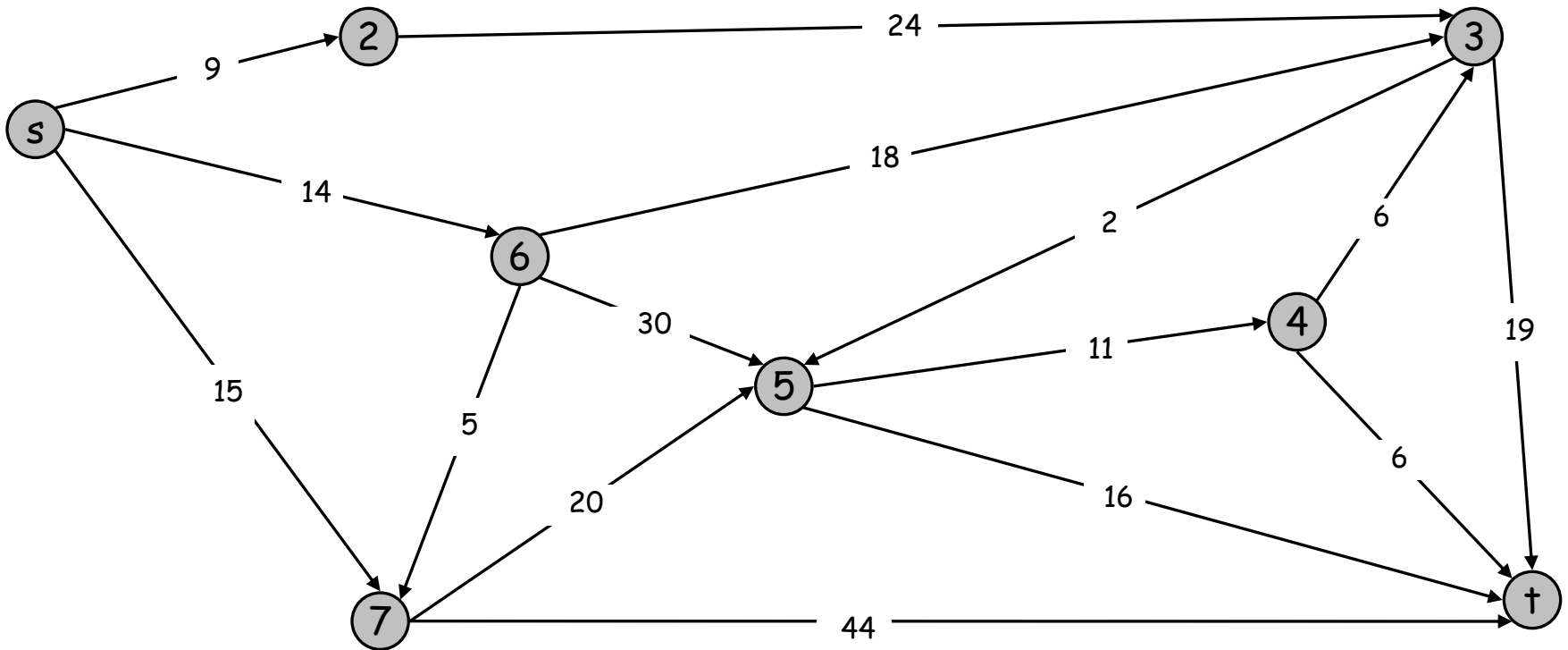


# Dijkstra's Shortest Path Algorithm

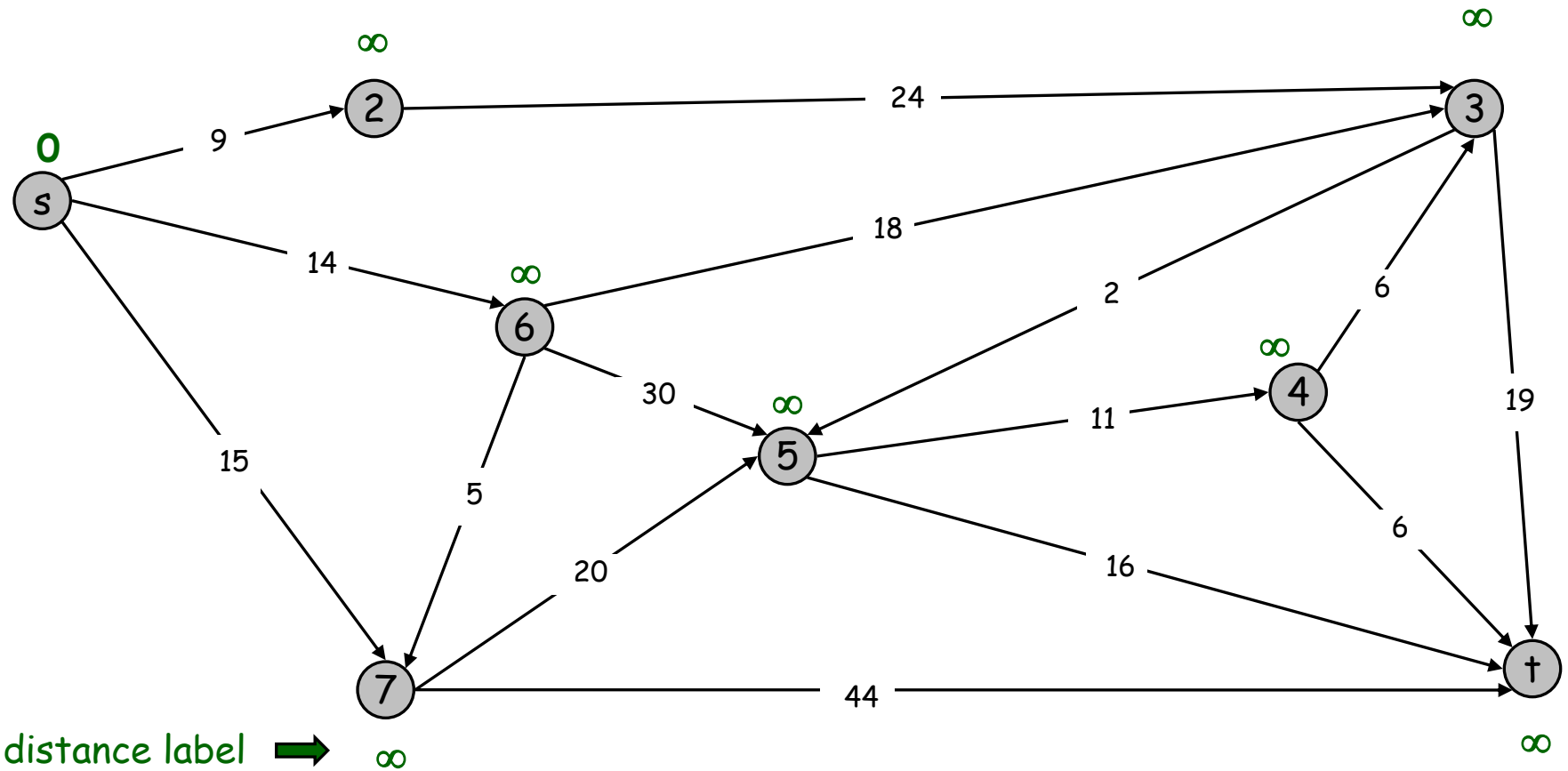
Find shortest path from s to t.



# Dijkstra's Shortest Path Algorithm

$S = \{ \}$

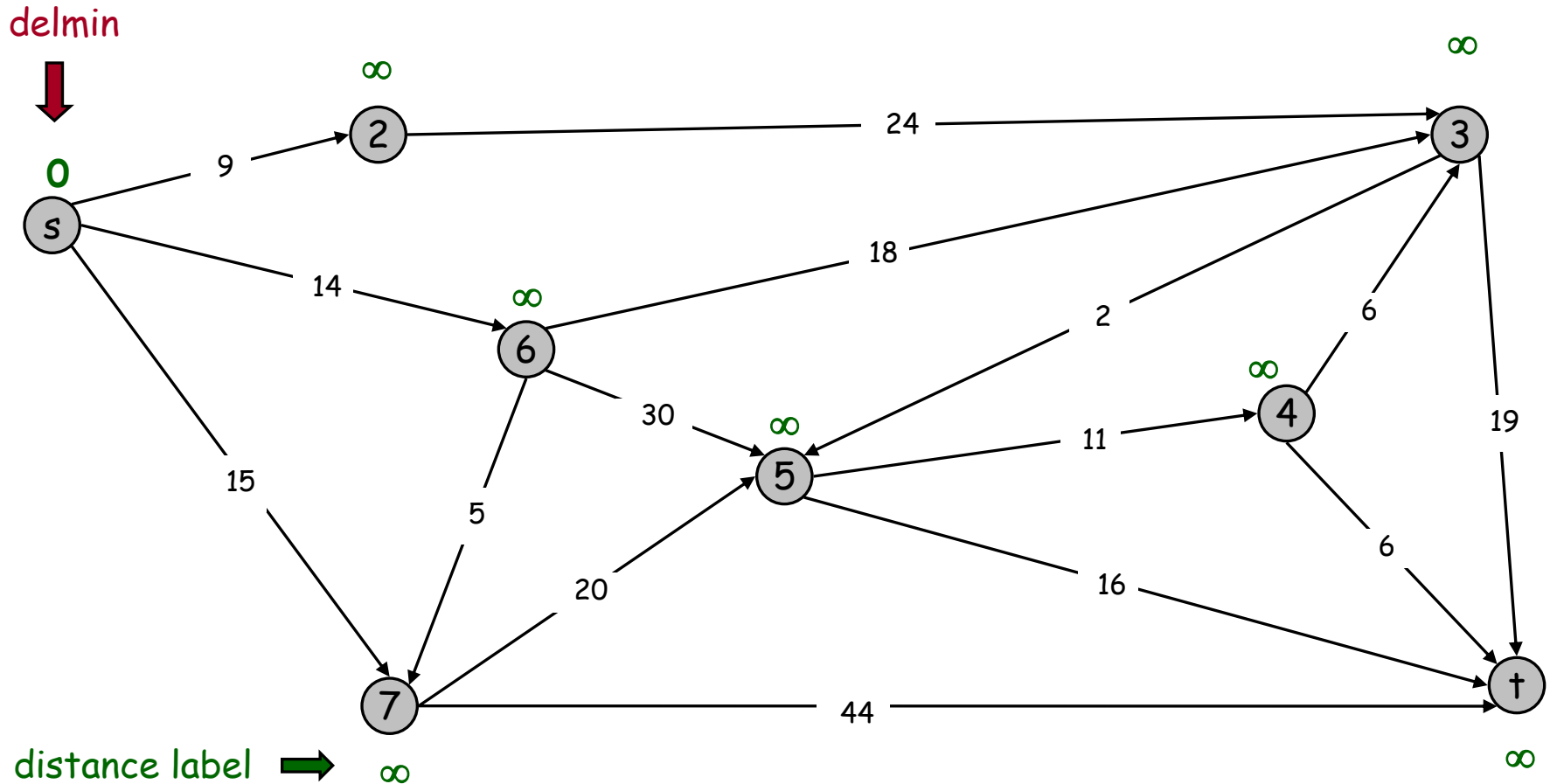
$PQ = \{ s, 2, 3, 4, 5, 6, 7, t \}$



# Dijkstra's Shortest Path Algorithm

$S = \{ \}$

$PQ = \{ s, 2, 3, 4, 5, 6, 7, t \}$



# Dijkstra's Shortest Path Algorithm

$S = \{s\}$

$PQ = \{2, 3, 4, 5, 6, 7, t\}$

decrease key

~~9~~

$\infty$

9

2

24

3

0

s

14

14

~~14~~

6

18

2

6

15

7

5

30

$\infty$

5

11

$\infty$

4

6

20

16

$\infty$

5

44

19

t

distance label



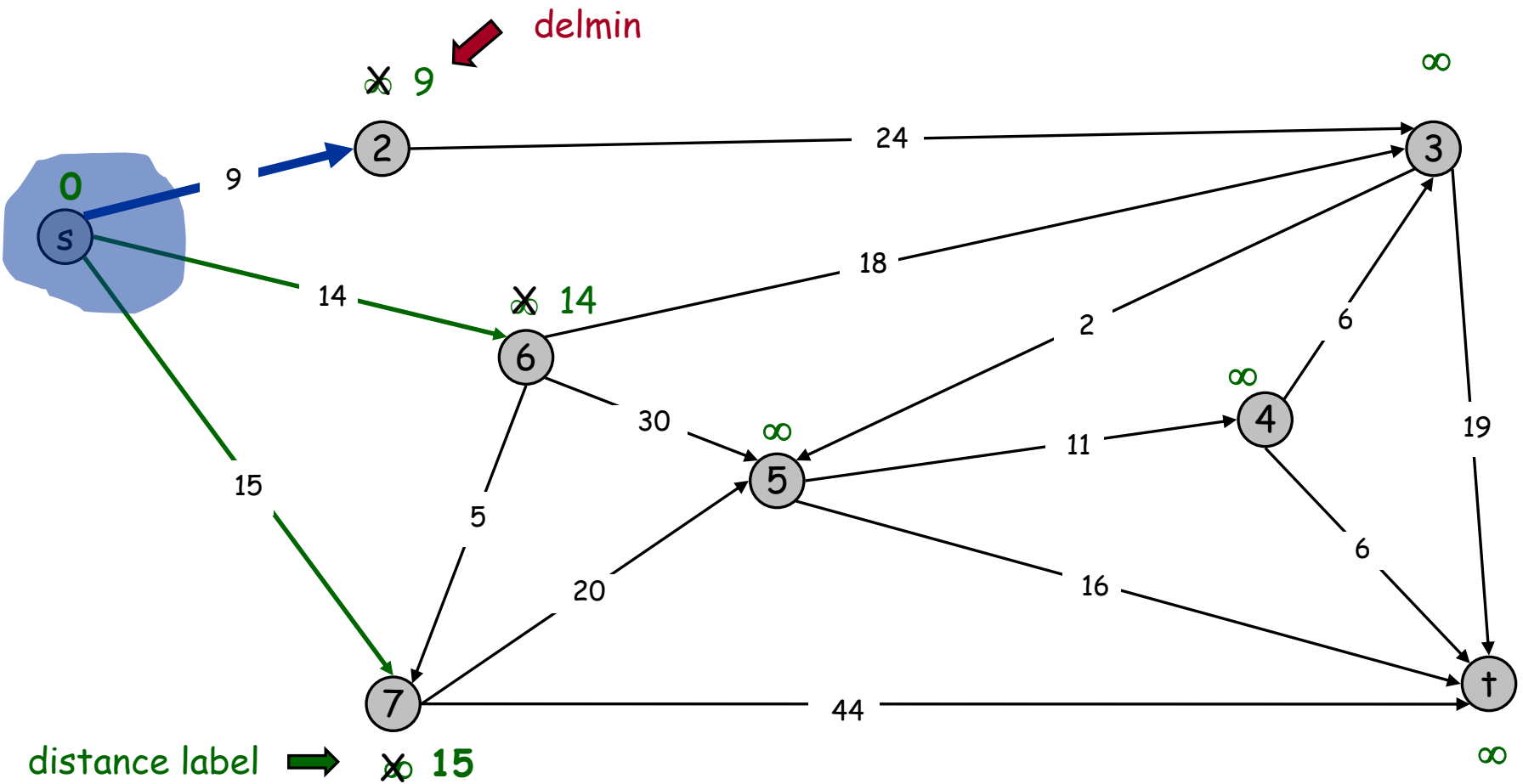
~~15~~

$\infty$

# Dijkstra's Shortest Path Algorithm

$S = \{s\}$

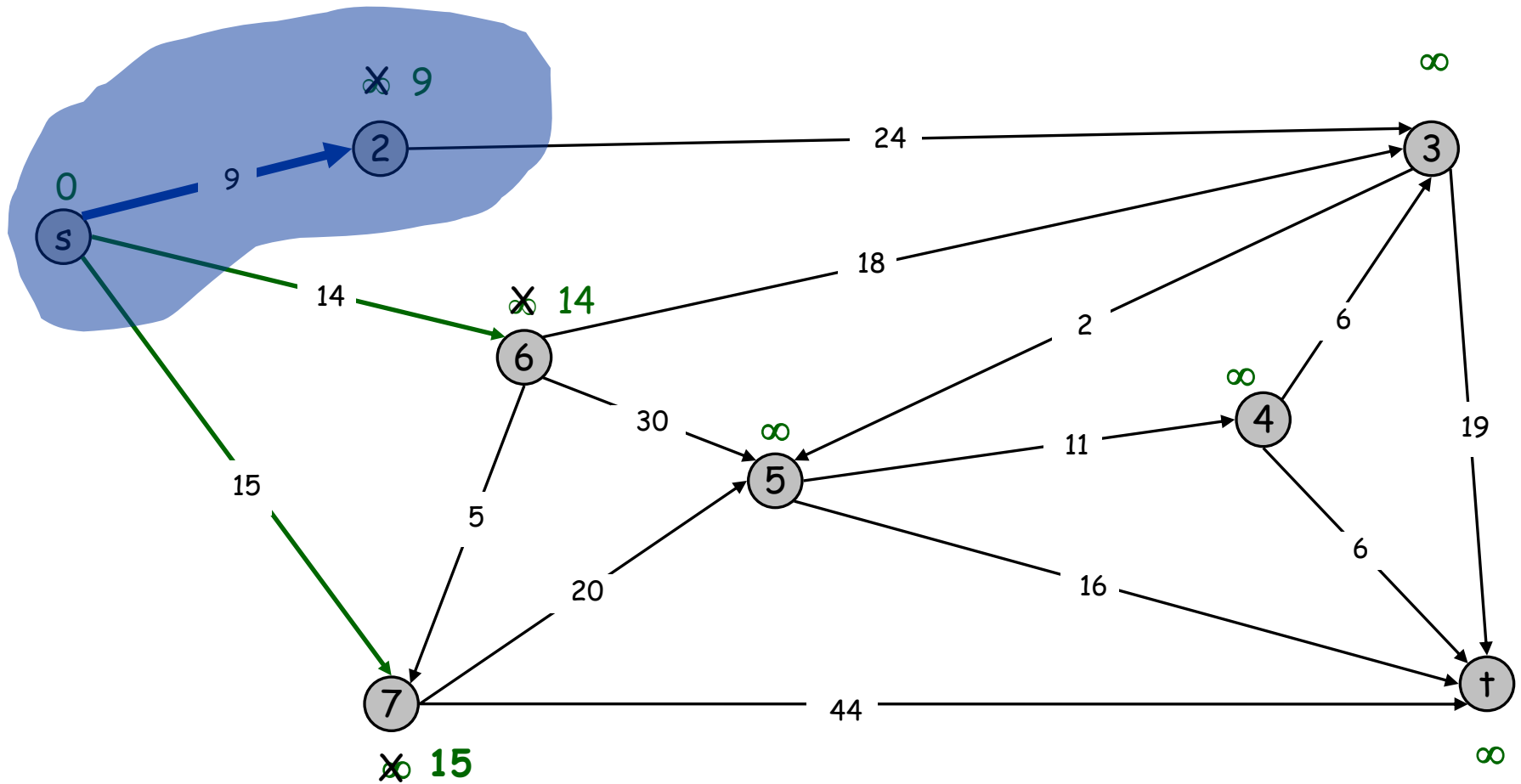
$PQ = \{2, 3, 4, 5, 6, 7, \dagger\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2\}$

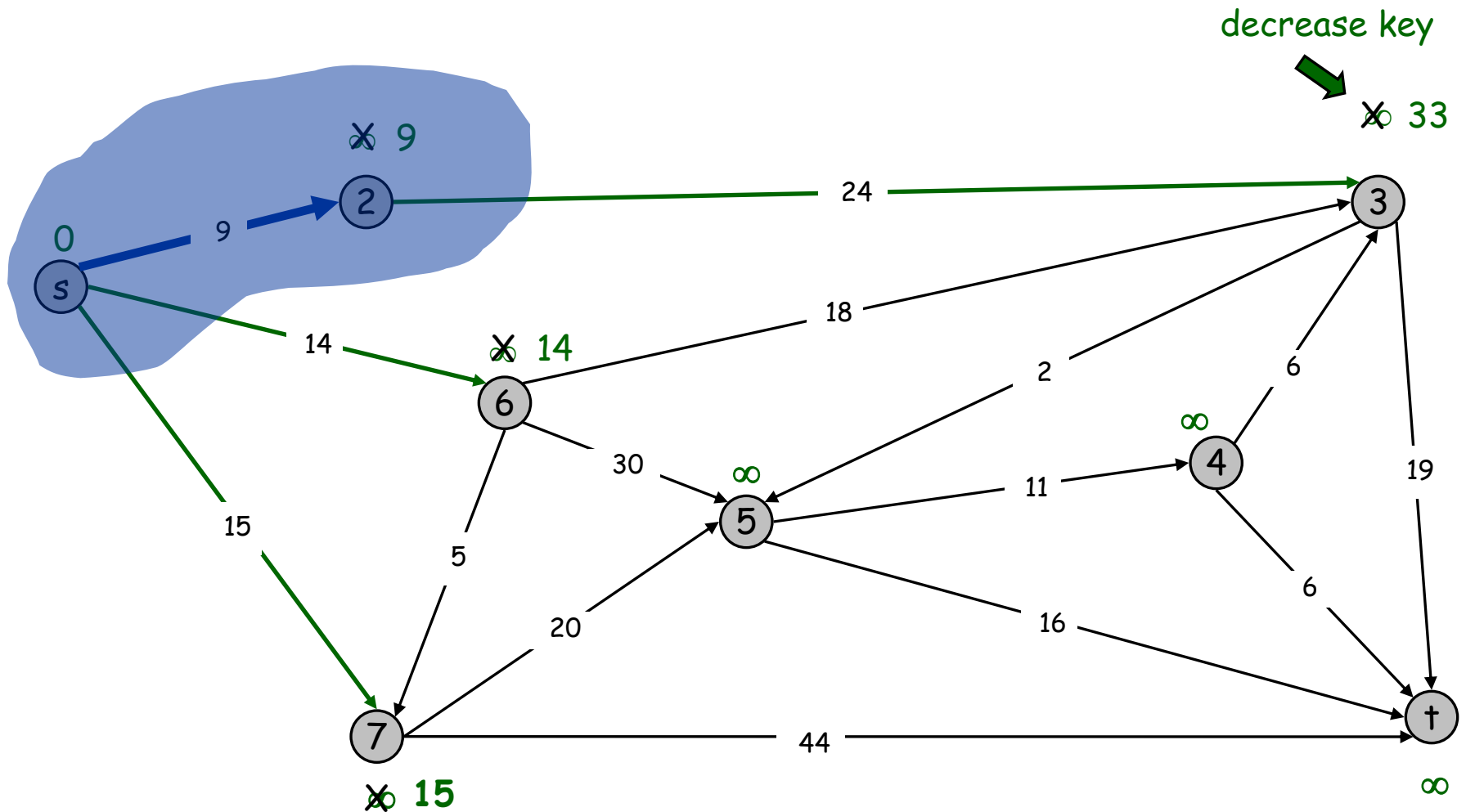
$PQ = \{3, 4, 5, 6, 7, t\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2\}$

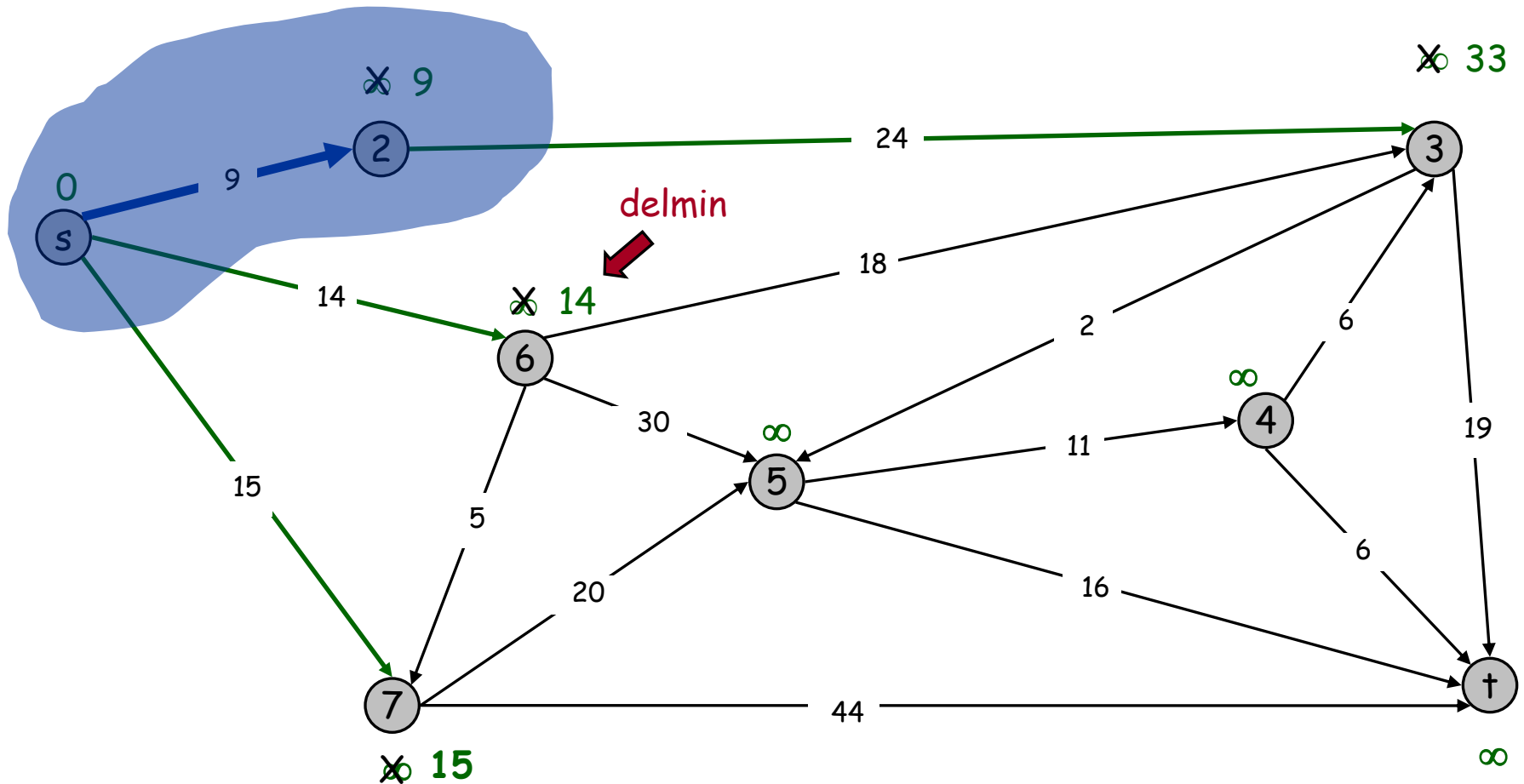
$PQ = \{3, 4, 5, 6, 7, t\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2\}$

$PQ = \{3, 4, 5, 6, 7, \dagger\}$

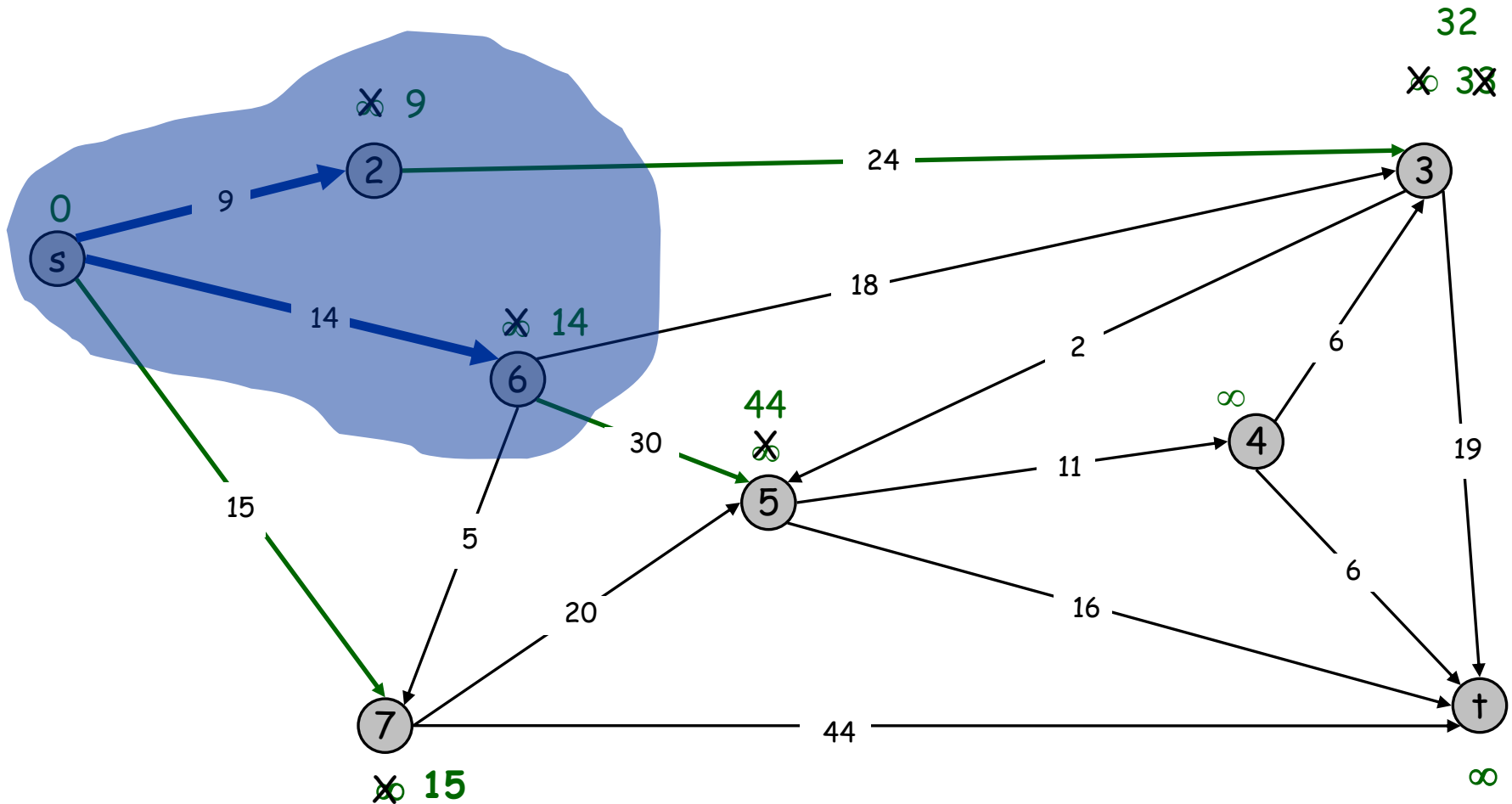




# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 6\}$

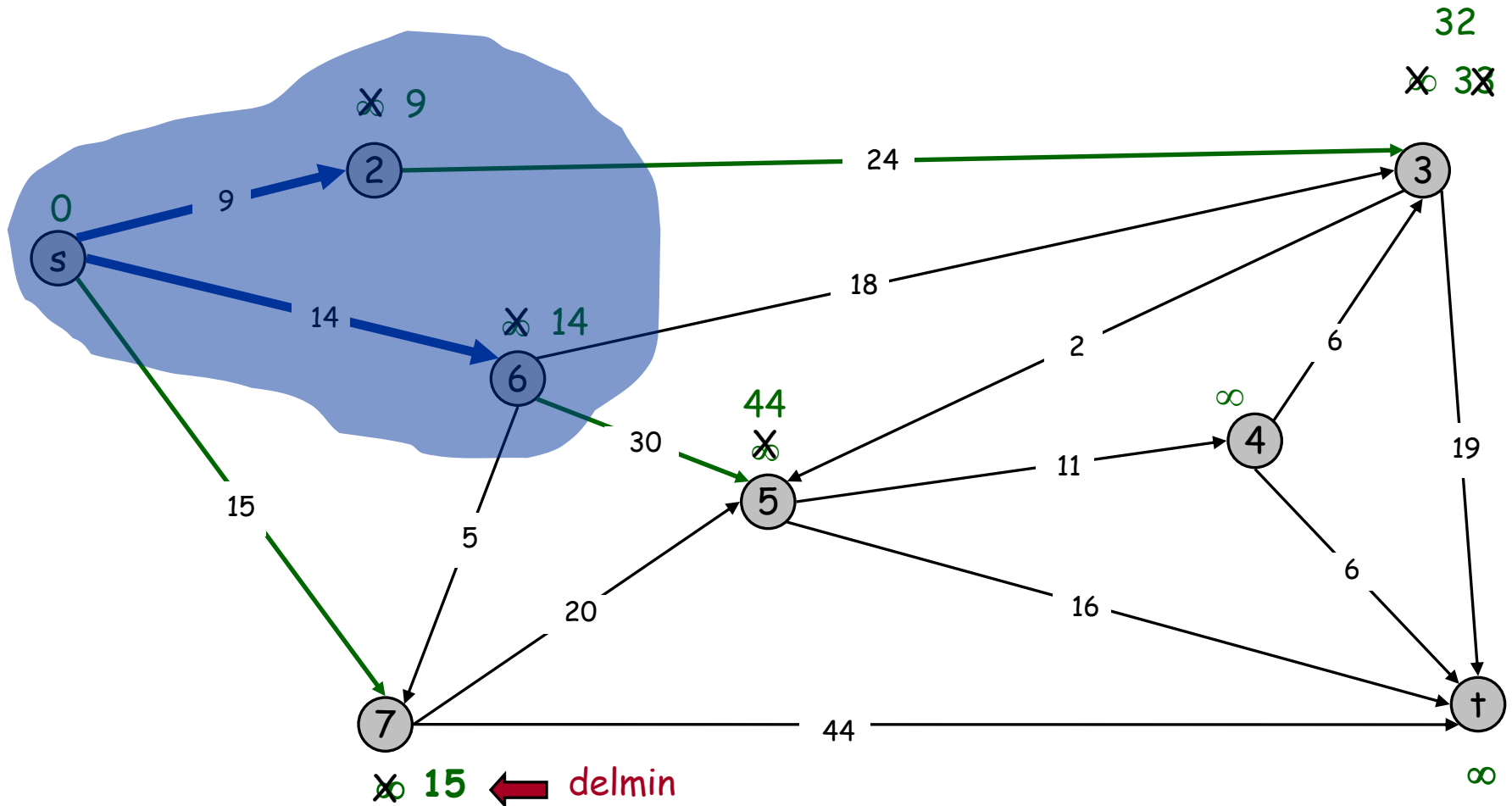
$PQ = \{3, 4, 5, 7, \dagger\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 6\}$

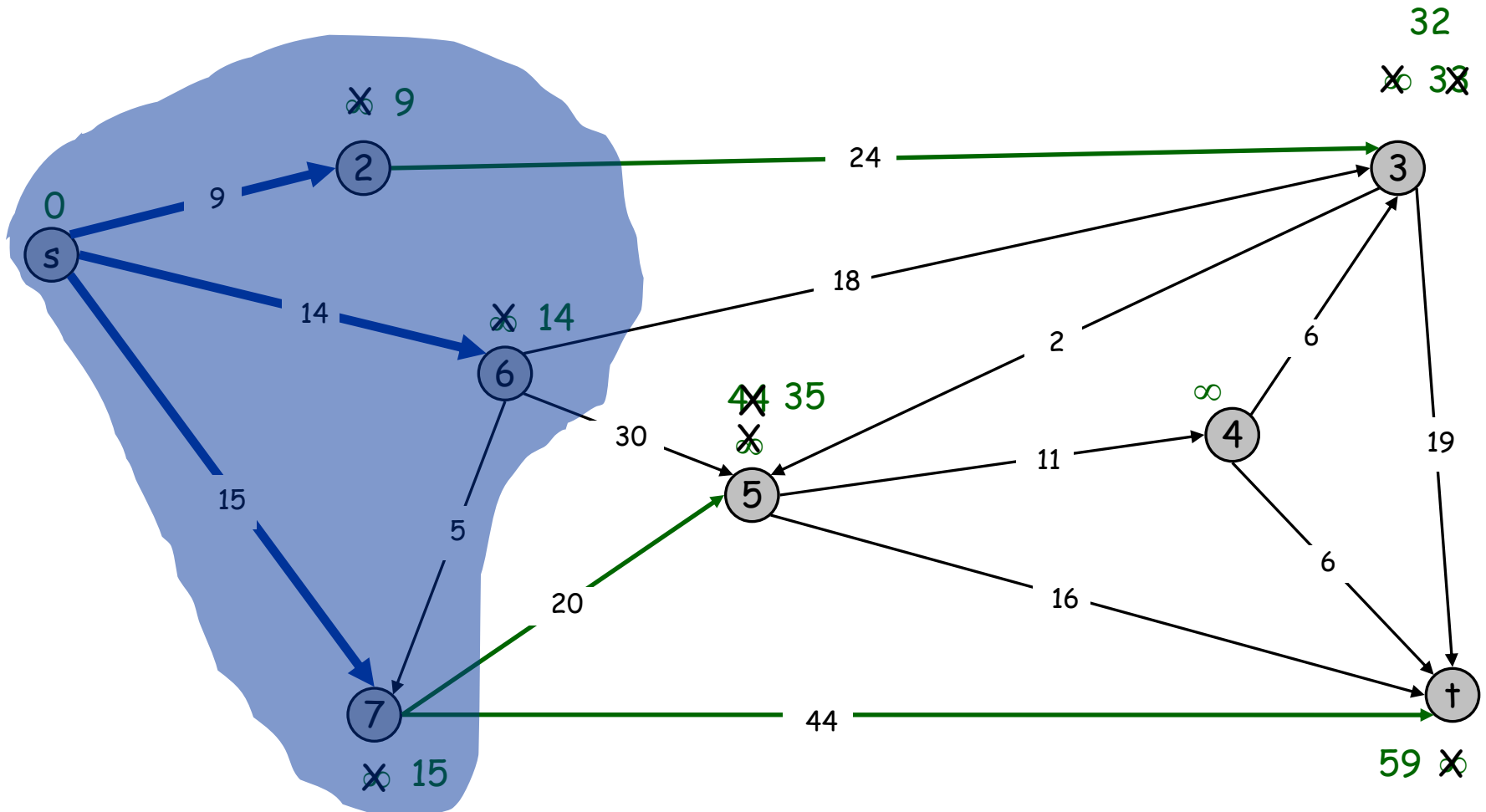
$PQ = \{3, 4, 5, 7, \dagger\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 6, 7\}$

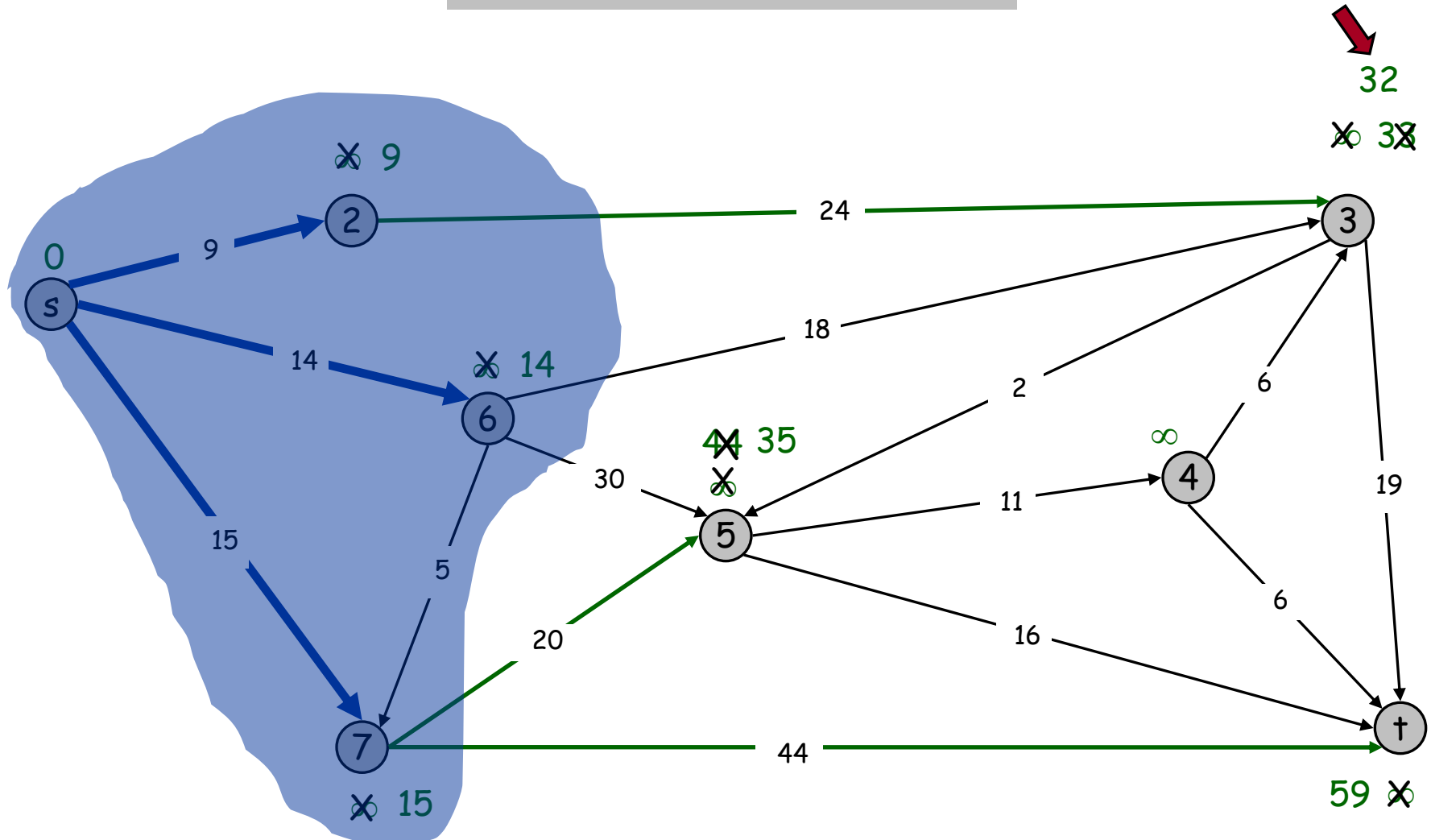
$PQ = \{3, 4, 5, \dagger\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 6, 7\}$

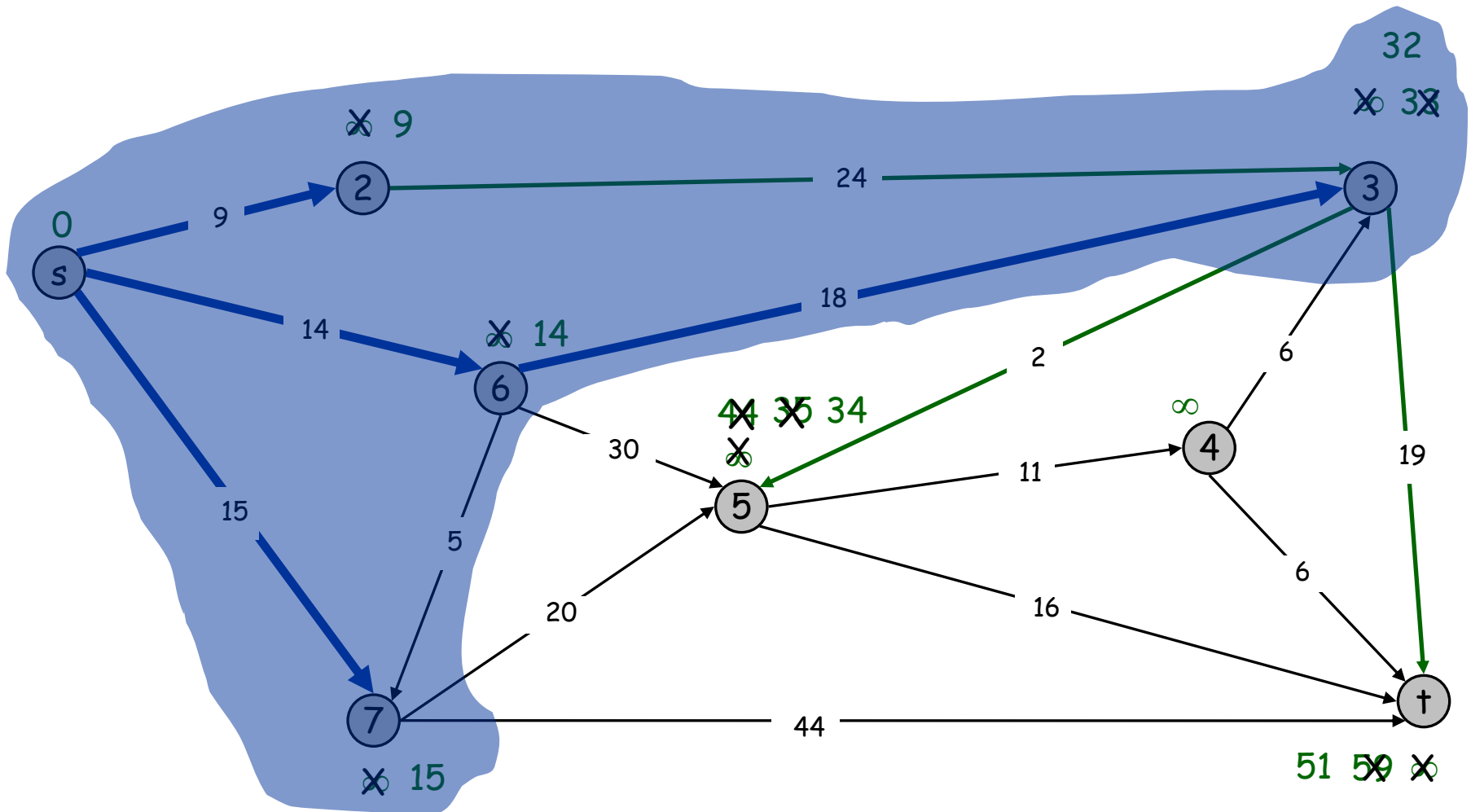
$PQ = \{3, 4, 5, \dagger\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 3, 6, 7\}$

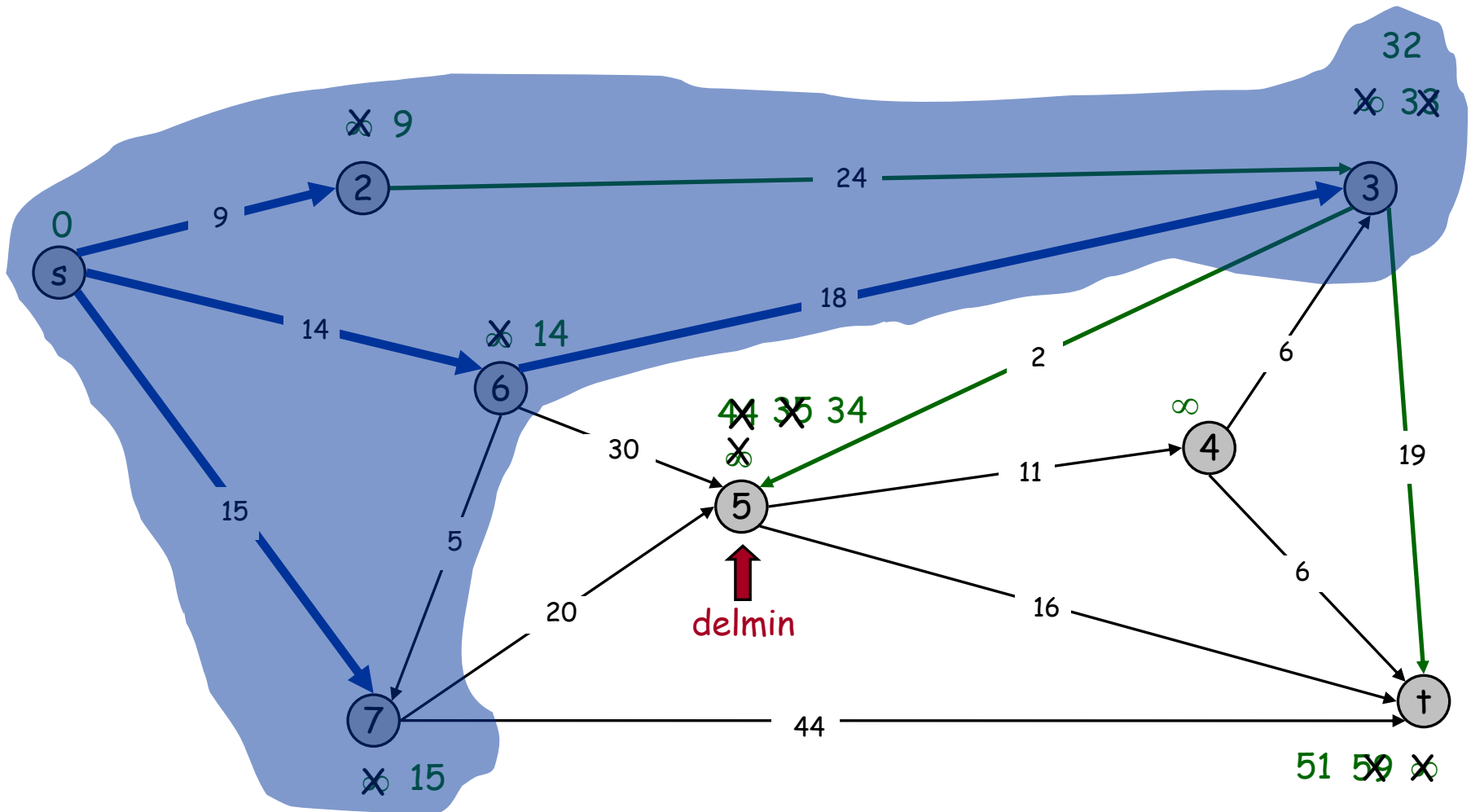
$PQ = \{4, 5, \dagger\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 3, 6, 7\}$

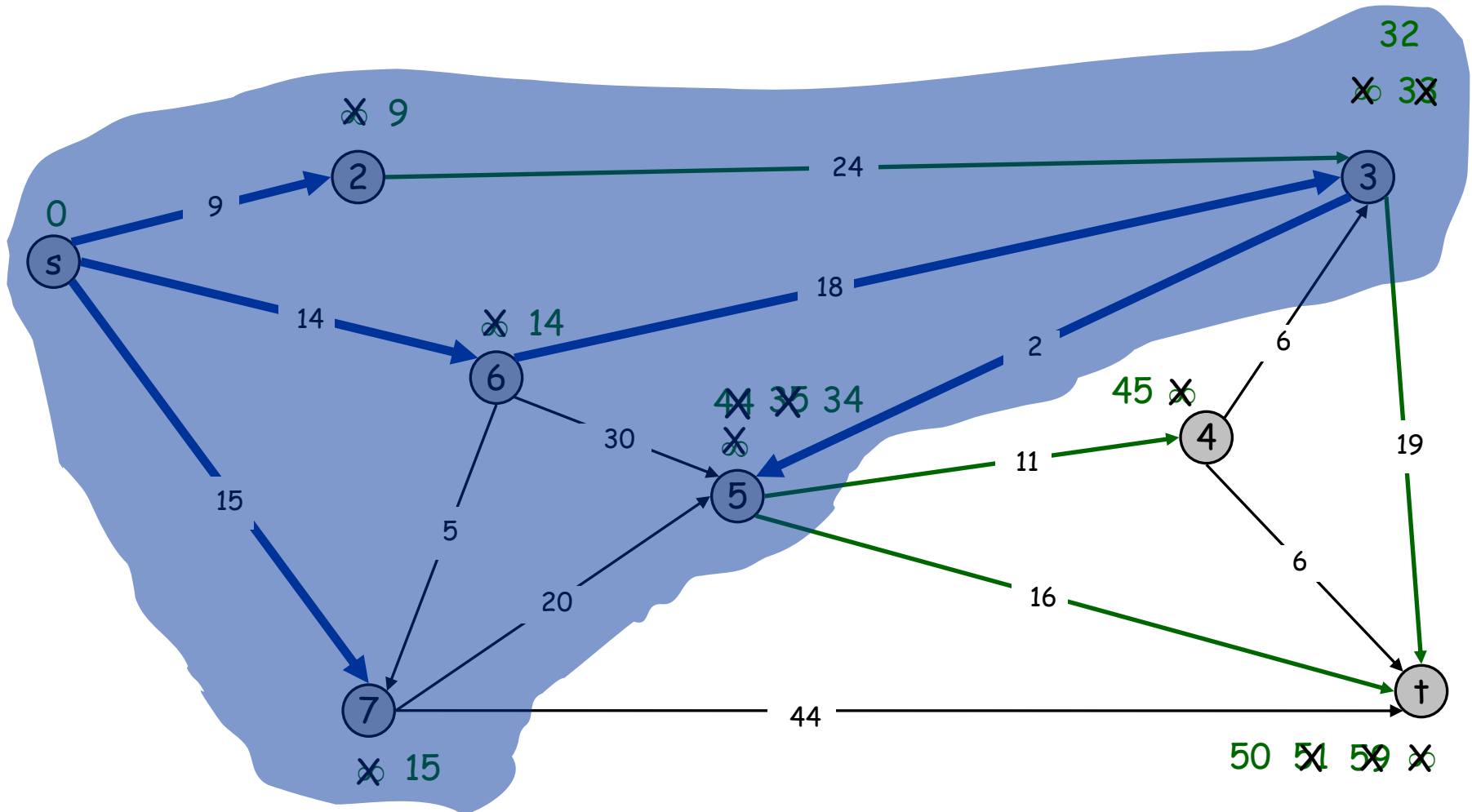
$PQ = \{4, 5, \dagger\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 3, 5, 6, 7\}$

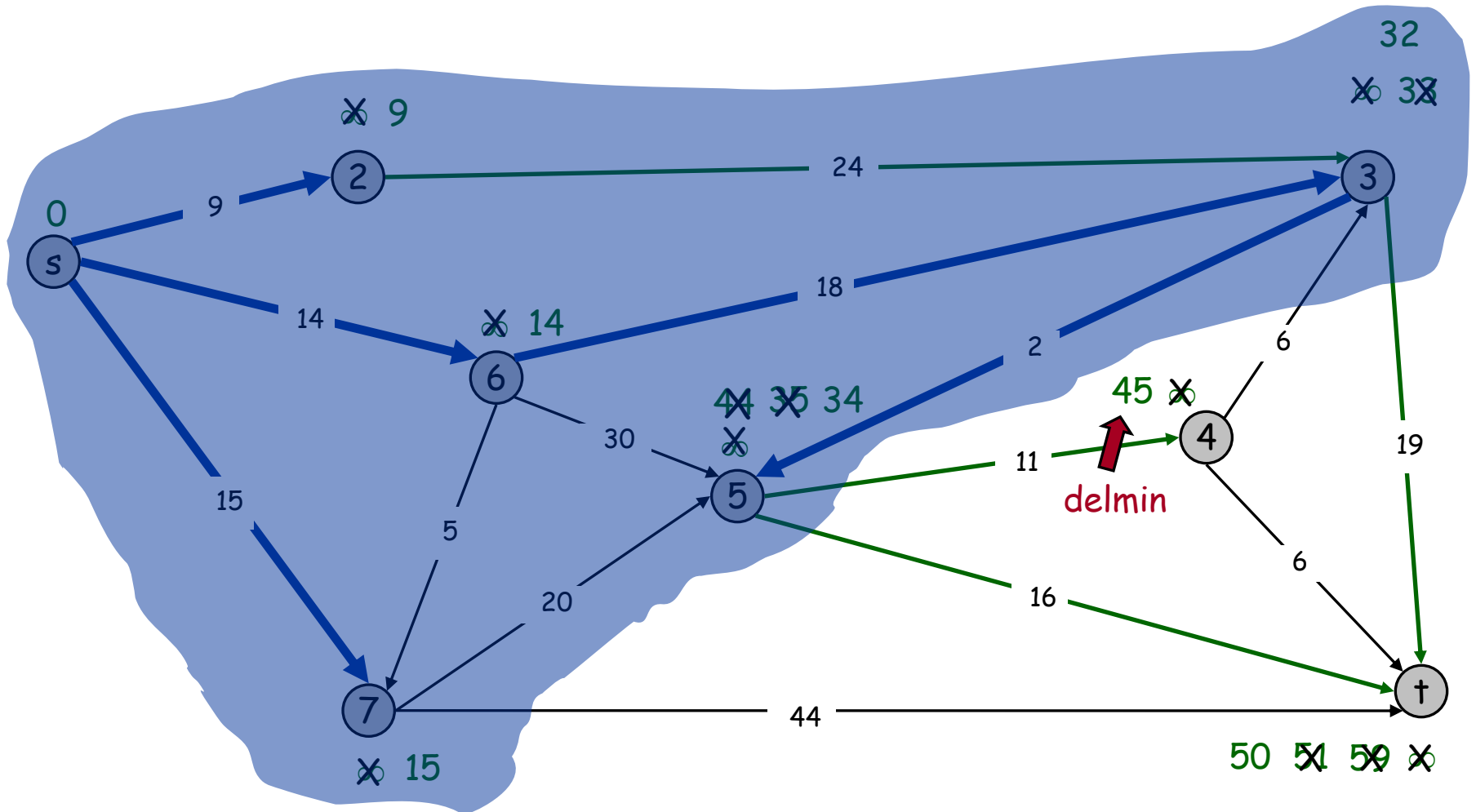
$PQ = \{4, t\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 3, 5, 6, 7\}$

$PQ = \{4, t\}$

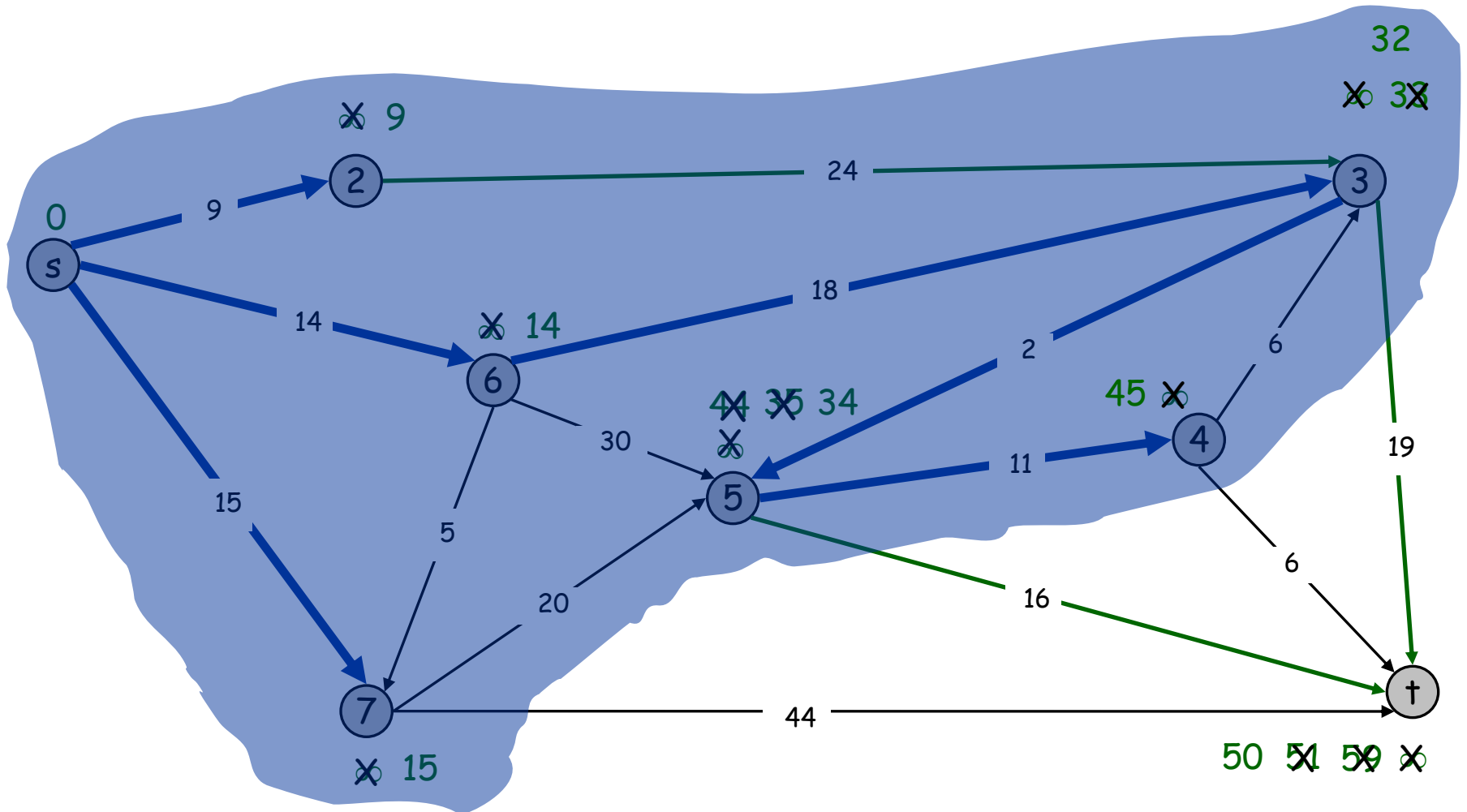




# Dijkstra's Shortest Path Algorithm

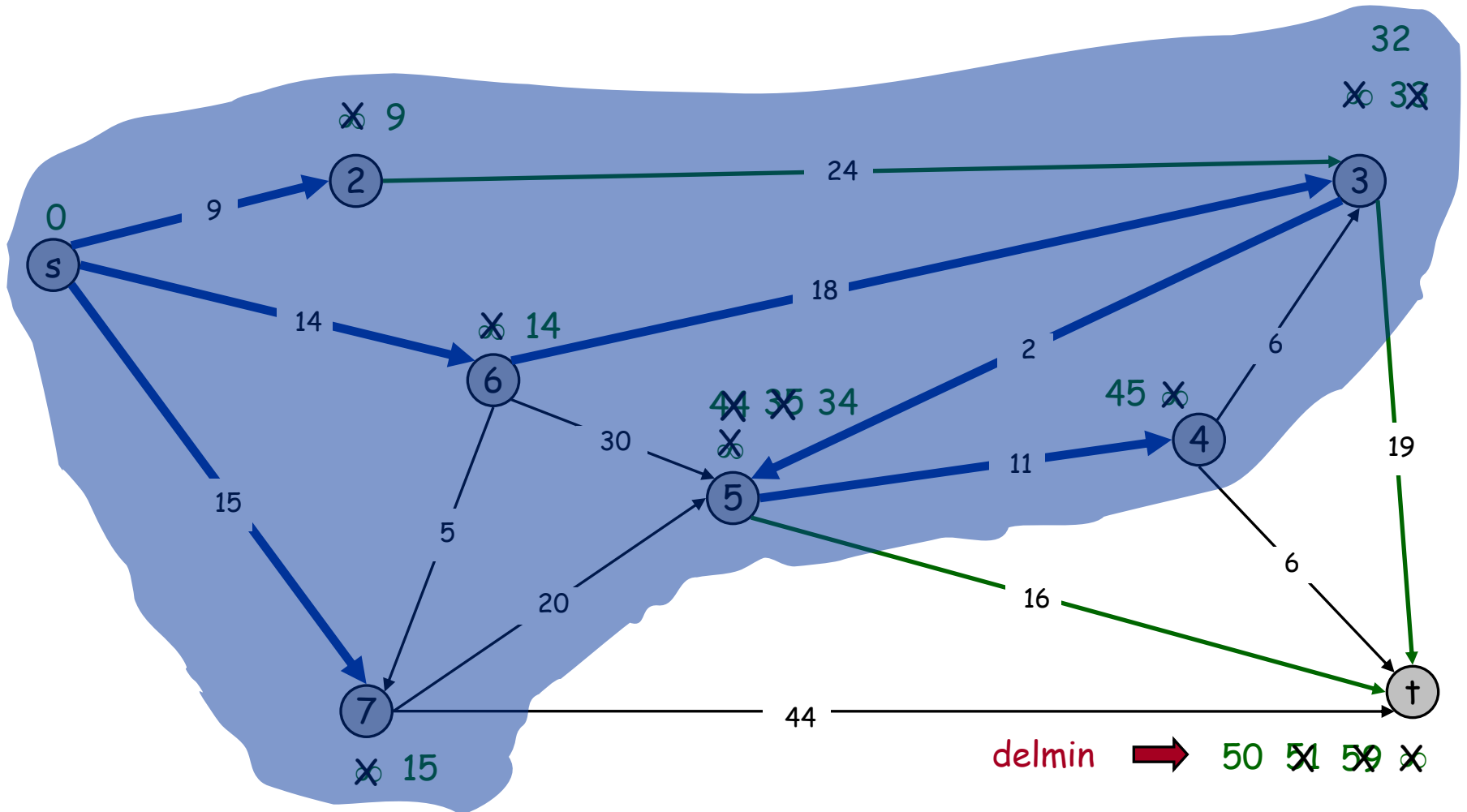
$S = \{s, 2, 3, 4, 5, 6, 7\}$

$PQ = \{t\}$



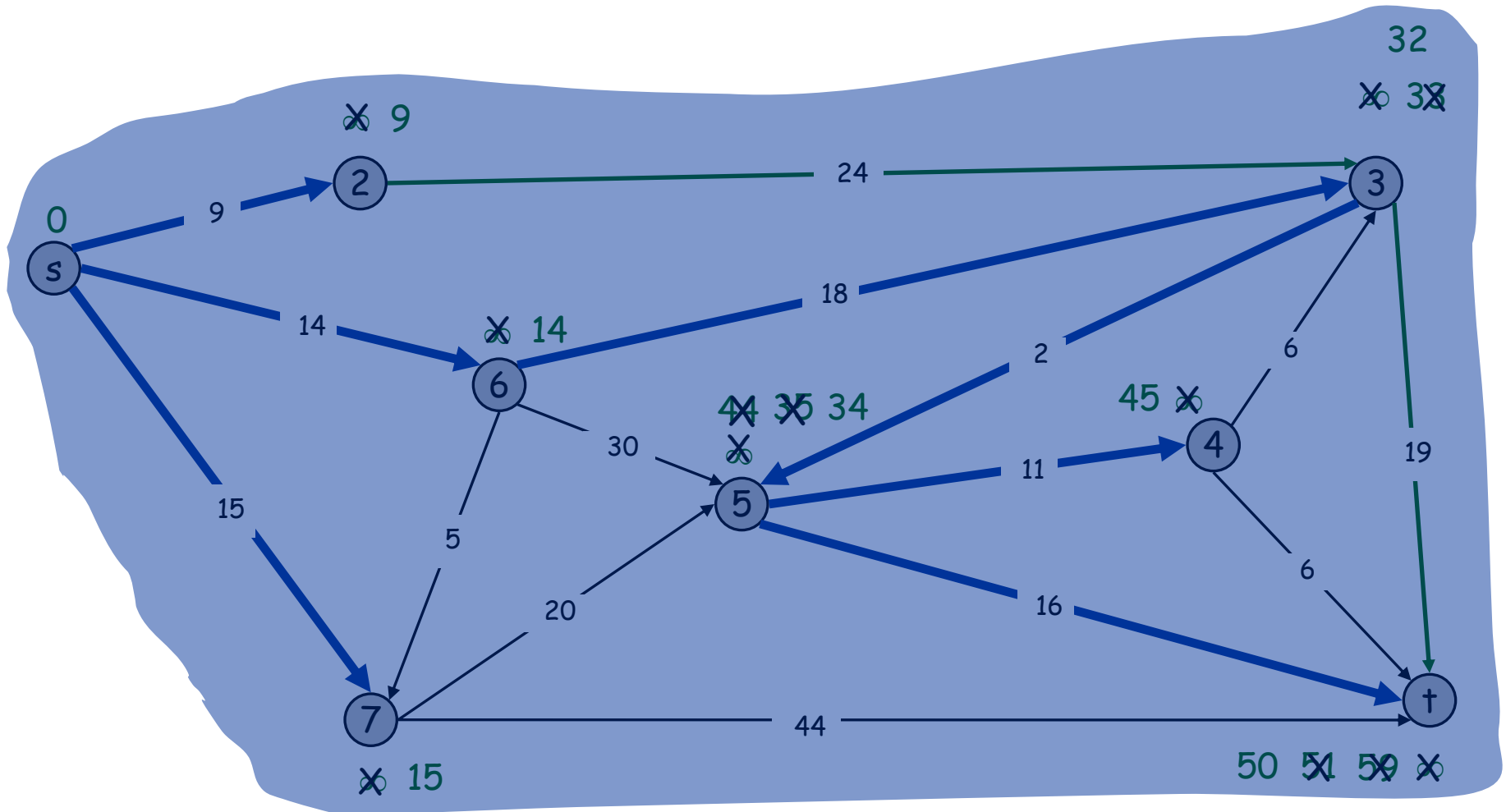
# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 3, 4, 5, 6, 7\}$   
 $PQ = \{t\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 3, 4, 5, 6, 7, t\}$   
 $PQ = \{\}$



# Dijkstra's Shortest Path Algorithm

$S = \{s, 2, 3, 4, 5, 6, 7, t\}$   
 $PQ = \{\}$

