

Adding an element

Check current node position, current node parent's position, current node's parent sibling color.

section	Current node position	Current node parent position	Current node parent sibling color
1	left	right	(left) red
2	right	right	(left) black
3	left	right	(left) black
4	right	right	(left) red
5	left	left	(right) red
6	right	left	(right) red
7	left	left	(right) black
8	right	left	(right) black

1.
 - a. set the color of current's parent to black.
 - b. set the color of current's parent left sibling to black.
 - c. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - d. set current to the grandparent of current.
2.
 - a. set the color of current's parent to black.
 - b. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - c. if current's grandparent does not equal null, then rotate current's parent to the left around current's grandparent.
3.
 - a. set current to its parent.
 - b. rotate current.left (the old current) to the right (around the new current).
 - c. set the color of current's parent to black.
 - d. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - e. if current's grandparent does not equal null, then rotate current's parent to the left around current's grandparent.

4.
 - a. set the color of current's parent to black.
 - b. set the color of current's parent left sibling to black.
 - c. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - d. if current's grandparent does not equal null, set current to the grandparent of current.
5.
 - a. set the color of current's parent to black.
 - b. set the color of current's parent right sibling to black.
 - c. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - d. if current's grandparent does not equal null, set current to the grandparent of current.
6.
 - a. set the color of current's parent to black
 - b. set the color of current's parent right sibling to black
 - c. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - d. if current's grandparent does not equal null, set current to the grandparent of current.
7.
 - a. set the color of current's parent to black.
 - b. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - c. if current's grandparent does not equal null, then rotate current's parent to the right around current's grandparent.
8.
 - a. set current to its parent.
 - b. rotate current.right (the old current) to the left (around the new current).
 - c. set the color of current's parent to black.
 - d. if current's grandparent does not equal null, set the color of current's grandparent to red.
 - e. if current's grandparent does not equal null, then rotate current's parent to the right around current's grandparent.

NB: Set the root's color to black as the last step.