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This study explores three in-service secondary teachers' conceptualization of different forms (Cartesian, polar, and exponential) of a complex number  $z$ . We used Sfard's (1991) dual conceptualization framework to document the representations (points, vectors, ordered pairs, etc.) used by the teachers in response to tasks involving different forms. These representations allowed us to determine whether a participant possessed an operational or structural conceptualization of a given form. Our results suggest that the teachers possessed an operational conception of the Cartesian form and exponential form. On the other hand, two teachers showed evidence of a structural conception of the Cartesian form – thus, indicating dual conceptualization of the Cartesian form. Our data seem to suggest that the courses one teaches influences one's conceptualization of complex numbers. Given the recommendations put forth by the National Council of Teachers of Mathematics, the Common Core State Standards Initiative, and the Mathematics Teacher Education 2, we offer suggestions for developing a dual conceptualization of complex numbers as part of teacher training and professional development programs. (Received September 17, 2012)