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Derivatives at several points: an important step between derivative at a point and derivative function.

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Summary: We present activities, with an interactive computer program, that serve to bridge two related but different concepts, derivative at a point and derivative function, and to help students understand better the relationships between the two. First, students work with tangent lines to the graph of the sine function at several points and then tabulate and graph the values of the slopes of these lines for the corresponding values of x . Then, students extend the function to an interval tracing the values of the slopes as the values of x change. Finally, students graph simultaneously the values of quotients of increments for several values of x to make more explicit the relation between the formal definitions of derivative at a point and derivative function.

Classification: I44 U74

Keywords: derivatives; mathematical concepts; derivative at a point; derivatives at several points; derivative of a function; differential calculus; differentiation; concept formation; misconceptions; trigonometric functions; student activities; slope of a tangent line; mathematical software; visualization; graphical representations; graph of a function