**Slope of Curve**

**How can you find the slope of a curve at a given point if 2 points are needed to make a line?**

**Answer1:** you are correct on that 2 points define a line. But a slope is not a line, but represents the direction or angle of that line. A curve has direction too, although it changes at every point along that curve. By understanding what the fundamental theorem of Calculus is saying you can identify and find the slope at any point along the curve. You must understand that the slope of a curve at any point along the curve is the slope of the tangent line - it touches the curve at just that one point and is perpendicular to then normal vector at that point. You don't need 2 points to define the slope.

In developing the fundamental theorem of Calculus, one first considered two points along the curve and the “slope” line that joins them. Then the two points are brought closer and closer together and the “slope” line between them becomes more and more accurate until you make the big leap and let the distance between the two points approach zero. The slope line then approaches the actual tangent and when the distance between the two points becomes zero you have just the one point and the actual slope of the curve at that point. The actual calculation of slope for different functions is the task of differential calculus and we are not going there (but it's really simple for polynomials functions.)

**Answer2:**

1. Two points are needed to establish a function for a line.
2. When you want to find the slope of a “line” you find the (x,y) coordinates of 2 points on the line. Then calculate (y₂-y₁)/(x₂-x₁).
3. Curves do not have “lines” or “line segments. Therefore the slope of a curve cannot be found by finding 2 points and using the formula 2.
4. Finding the slope of a “curve” requires calculus. Specifically differential calculus. Example if f(x) = x² then the first derivative f′(x) =2x. If you need to find the slope at a given point (x₂,y₂) then calculate 2x₂. If x₂ = 3 then the slope at (x₂,y₂) will be 2 x 3 =6.

**Related:**

There is no such thing as the "slope of a curve" per se; what you have to find is the slope of the line that hugs the curve closely at a given point, called the tangent line at that point. You can find this by taking the derivative of the equation of the curve and then plugging in the x value of that point. That's the very beginning of calculus; you can watch Sal's videos on taking derivatives in the Calculus section.

A curve is not a line but I get what you mean. The slope of a curve is given by it's derivative.  
A derivative is a tangent line which touches a point and only that point. The slope of a curve is defined by the slope of the derivative (tangent line to that point). And since the tangent is a line you can find the slope of the tangent which is the slope at that point on the curve  
It gives a general equation for the slope at any given point on the curve but it won't have a definitive slope because the slope changes.  
For example y = x^2 (y= x squared) is a curve  
Its derivative is 2x which means the slope at any point on the curve is 2x  
So when x =1 the slope is 2 when x=2 the slope is 4 when x = 50 the slope is 100 and so on  
Curves have no definitive slope.