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curveTangent()

Calculates coordinates along a line that's tangent to a spline curve.

Tangent lines skim the surface of a curve. A tangent line's slope equals the curve's slope at the point where it intersects.

`curveTangent()` calculates coordinates along a tangent line using the spline curve's anchor and control points. It expects points in the same order as the `curve()` function. `curveTangent()` works one axis at a time. Passing the anchor and control points' x-coordinates will calculate the x-coordinate of a point on the tangent line. Passing the anchor and control points' y-coordinates will calculate the y-coordinate of a point on the tangent line.

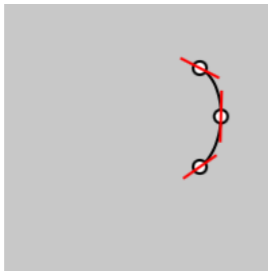
The first parameter, `a`, is the coordinate of the first control point.

The second and third parameters, `b` and `c`, are the coordinates of the anchor points.

The fourth parameter, `d`, is the coordinate of the last control point.

The fifth parameter, `t`, is the amount to interpolate along the curve. 0 is the first anchor point, 1 is the second anchor point, and 0.5 is halfway between them.

Examples



```
function setup() {
  createCanvas(100, 100);

  background(200);

  // Set the coordinates for the curve's anchor and control
  points.
  let x1 = 5;
  let y1 = 26;
  let x2 = 73;
  let y2 = 24;
  let x3 = 73;
  let y3 = 61;
  let x4 = 15;
  let y4 = 65;

  // Draw the curve.
  noFill();
  curve(x1, y1, x2, y2, x3, y3, x4, y4);

  // Draw tangents along the curve's path.
  fill(255);

  // Top circle.
  stroke(0);
  let x = curvePoint(x1, x2, x3, x4, 0);
  let y = curvePoint(y1, y2, y3, y4, 0);
  circle(x, y, 5);

  // Top tangent line.
  // Scale the tangent point to draw a shorter line.
  stroke(255, 0, 0);
  let tx = 0.2 * curveTangent(x1, x2, x3, x4, 0);
```

Syntax

```
curveTangent(a, b, c, d, t)
```

Parameters

a	Number: coordinate of first control point.
b	Number: coordinate of first anchor point.
c	Number: coordinate of second anchor point.
d	Number: coordinate of second control point.
t	Number: amount to interpolate between 0 and 1.

Returns

Number: coordinate of a point on the tangent line.

This page is generated from the comments in `src/core/shape/curves.js`. Please feel free to edit it and submit a pull request!

Related References

bezier Draws a Bézier curve.	bezierDetail Sets the number of segments used to draw Bézier curves in WebGL mode.	bezierPoint Calculates coordinates along a Bézier curve using interpolation.	bezierTangent Calculates coordinates along a line that's tangent to a Bézier curve.
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p5.js

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