

bezierTangent()

Calculates coordinates along a line that's tangent to a Bézier 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.

`bezierTangent()` calculates coordinates along a tangent line using the Bézier curve's anchor and control points. It expects points in the same order as the `bezier()` function. `bezierTangent()` 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 anchor point.

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

The fourth parameter, `d`, is the coordinate of the last anchor 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 = 85;
  let x2 = 10;
  let x3 = 90;
  let x4 = 15;
  let y1 = 20;
  let y2 = 10;
  let y3 = 90;
  let y4 = 80;

  // Style the curve.
  noFill();

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

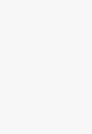
  // Draw tangents along the curve's path.
  fill(255);

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

  // Top-right tangent line.
  // Scale the tangent point to draw a shorter line.
  stroke(255, 0, 0);
  let tx = 0.1 * bezierTangent(x1, x2, x3, x4, 0);
```

Syntax

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



Parameters

a	Number: coordinate of first anchor point.
b	Number: coordinate of first control point.
c	Number: coordinate of second control point.
d	Number: coordinate of second anchor 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.

