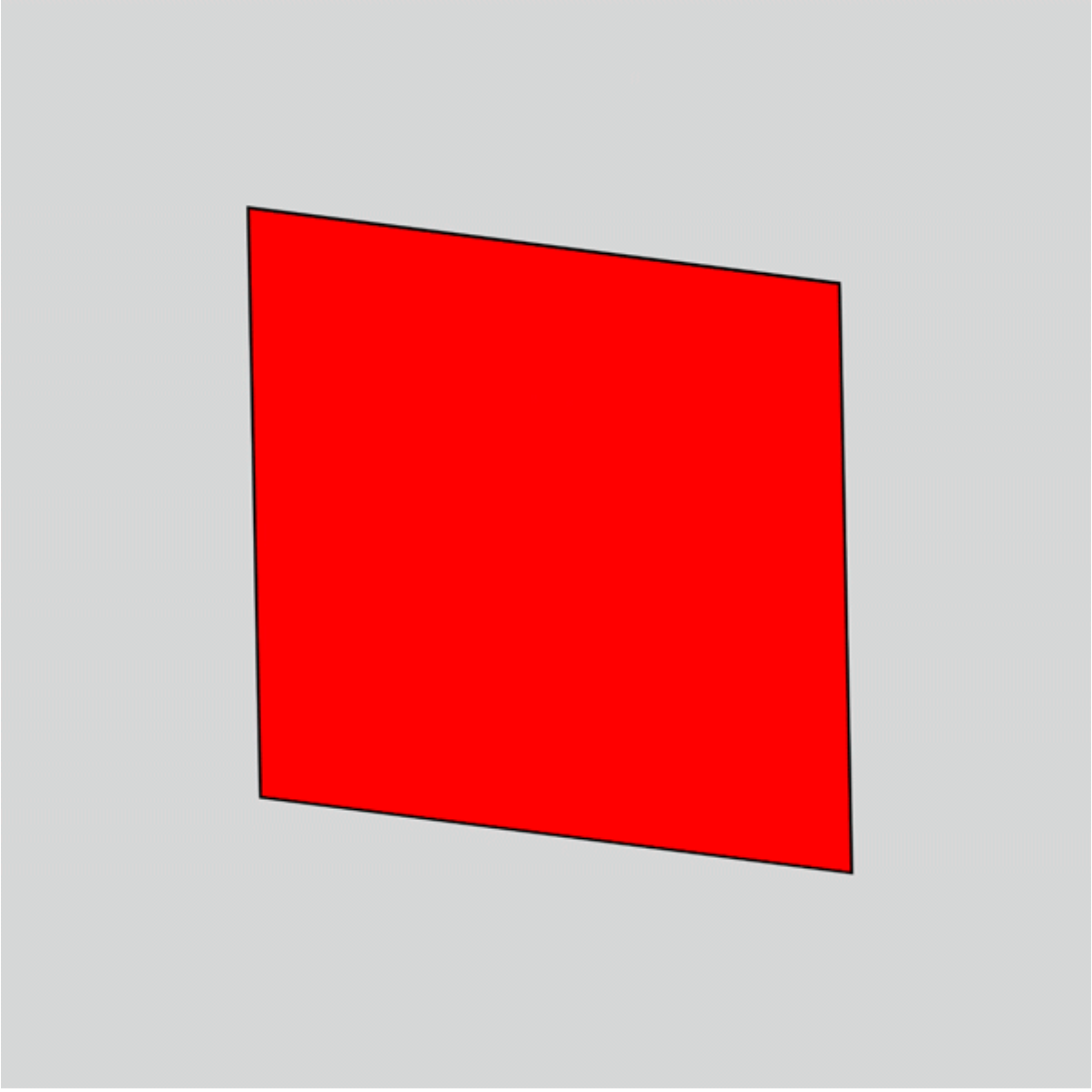
Shear

6 min

Shear functions skew a shape in a specific direction. The shape is sheared by the angle amount specified as the function's argument. In p5.js, shapes are sheared in a clockwise direction. If the angle value is negative, the shape will shear in a counter-clockwise direction.

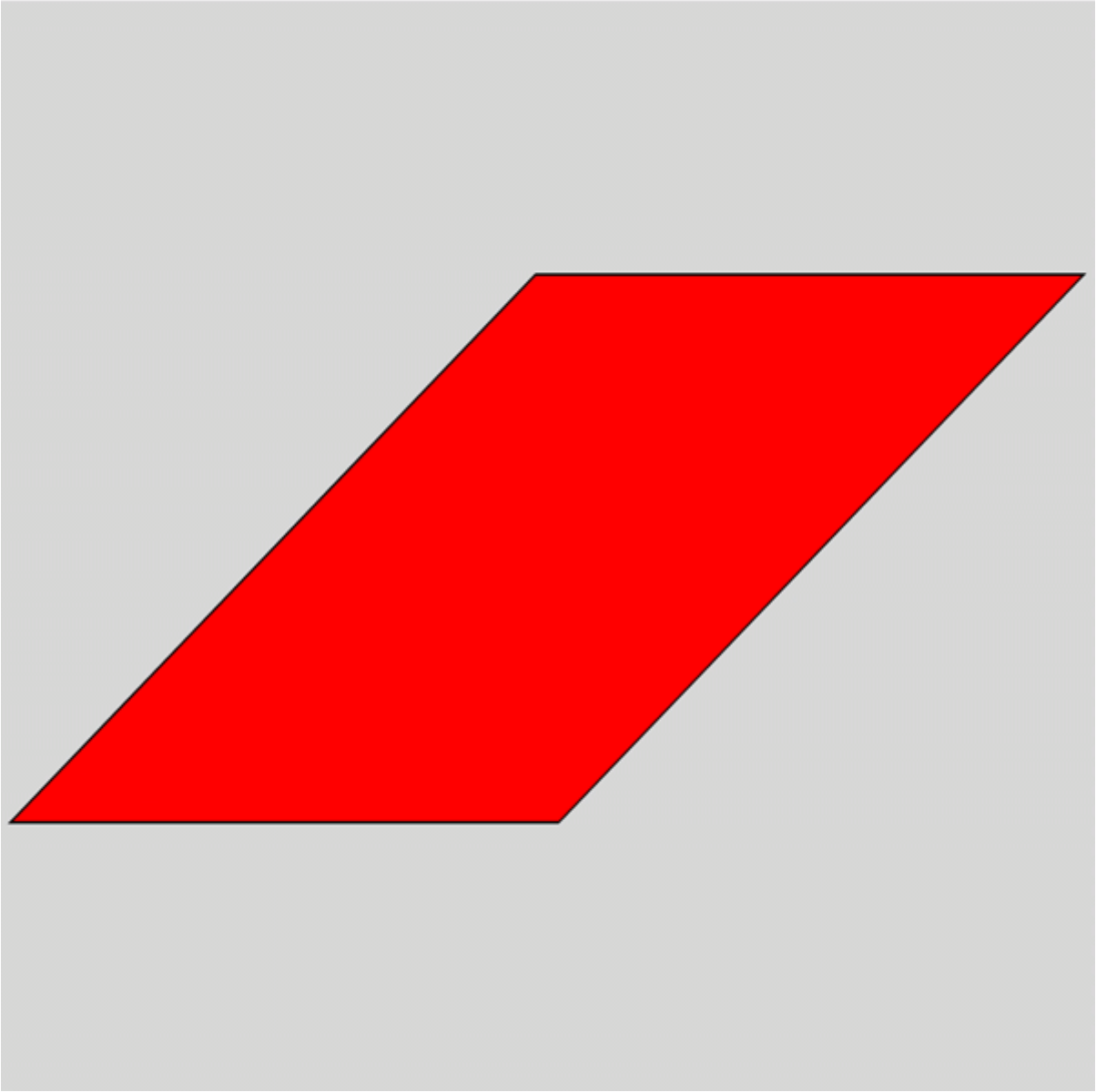
The image below shows a rectangle being sheared in both the x- and y-axis with angle values ranging from positive to negative.



The `shearX()` function angles a shape around the x-axis by the amount given as its argument. The below code horizontally shears the rectangle by 0.5 radians.

```
shearX(0.5);
rect(100, 100, 150, 200);
```

The image below shows a rectangle sheared along the x-axis.



The `shearY()` function angles a shape around the y-axis by the amount specified as the argument. The below code vertically shears the rectangle by `QUARTER_PI` radians.

```
shearY(QUARTER_PI);
rect(100, 100, 150, 200);
```

The image below shows a rectangle sheared along the y-axis.

Note that the arguments of the `shearX()` and `shearY()` functions are interpreted in radians by default but can be changed calling the `angleMode()` function before a shear function is called.

Instructions

1.

Below the `rectMode()` function, specify the angle mode to be in `DEGREES`.
Hint
You can specify the angle mode using the `angleMode()` function—either as `DEGREES` or `RADIANS`.

2.

Above the first `for` loop, horizontally shear the red rectangles by 15 degrees.
Hint
The syntax to shear a shape along the x-axis is:

```
shearX(angle);
```

To horizontally shear a shape by 45 degrees, you would write:

```
shearX(45);
```

3.

Above the second `for` loop, horizontally shear the blue rectangles by -15 degrees.
Hint
The syntax to shear a shape along the x-axis is:

```
shearX(angle);
```

4.

Above the last `for` loop, vertically shear the purple rectangles by a value of `frameCount / 25` degrees.
Hint
The syntax to shear a shape along the y-axis is:

```
shearY(angle);
```

sketch.js

```
function setup() {
  createCanvas(windowWidth, windowHeight);
  noStroke();
}

function draw() {
  background(0);
  rectMode(CENTER);

  // TODO: Specify angle mode to be in degrees
  angleMode(DEGREES);

  // RED: First Pattern
  // TODO: Horiontally shear the pattern by 15 degrees
  shearX(15);
  for (let i = 0; i < width; i += 75) {
    for (let j = 0; j < height; j += 75) {
      fill(255, 0, 0, 180);
      rect(i, j, 50, 50);
    }
  }

  // BLUE: Second Pattern
  // TODO: Horiontally shear the pattern by -15 degrees
  shearX(-15);
  for (let i = 0; i < width; i += 75) {
    for (let j = 0; j < height; j += 75) {
      fill(0, 0, 255, 180);
      rect(i, j, 50, 50);
    }
  }

  // PURPLE: Third Pattern
  // TODO: Vertically shear the pattern by frameCount/25
  shearY(frameCount / 25);
  for (let i = 0; i < width * 2; i += 75) {
    for (let j = 0; j < height * 2; j += 75) {
      fill(200, 0, 255, 180);
      rect(i, j, 50, 50);
```

```
    }
  }
}
```