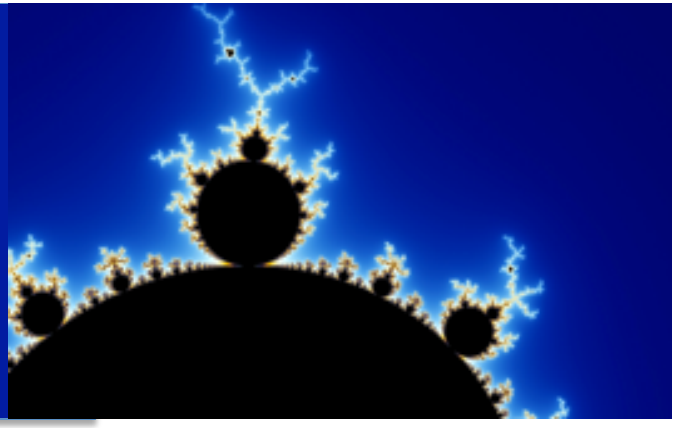
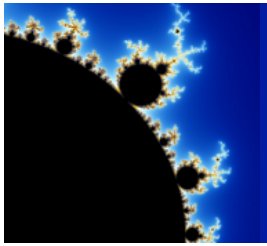
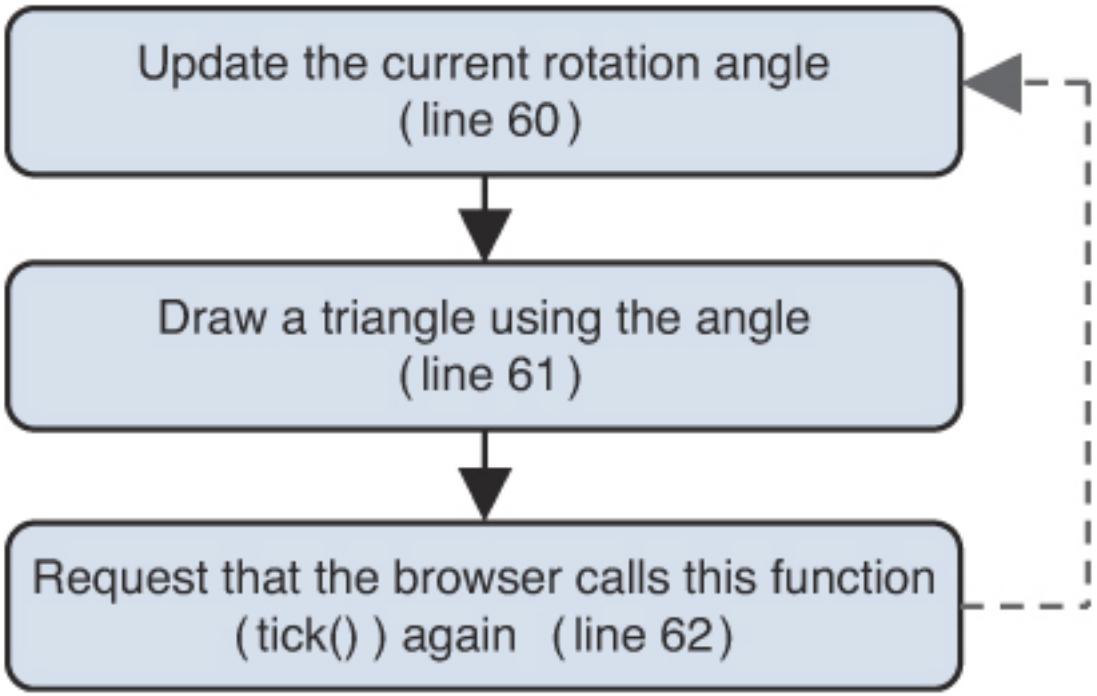
Computer Graphics



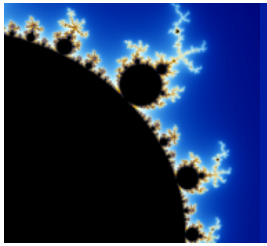
Perform Animation with WebGL



Basic Steps used in animation



rotateTriangle example



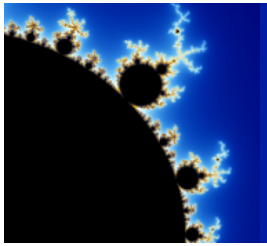
setInterval(func, delay)

`setInterval` `(func, delay)`

Call the function specified by *func* multiple times with intervals specified by *delay*.

Parameters	func	Specifies the function to be called multiple times.
	delay	Specifies the intervals (in milliseconds).
Return value	Timer id	

- Javascript method
- Multiple tab problem → disregard which tab is active → performance problem



requestAnimationFrame

requestAnimationFrame (func)

Requests the function specified by *func* to be called on redraw (see Figure 4.9). This request needs to be remade after each callback.

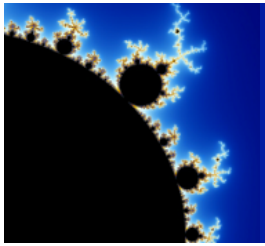
Parameters	func	Specifies the function to be called later. The function takes a "time" parameter, indicating the timestamp of the callback.
Return value	Request id	

- func is only called when the tab to which it is defined is active
- By using this method, you avoid animation in inactive tabs and do not increase the load on the browser.

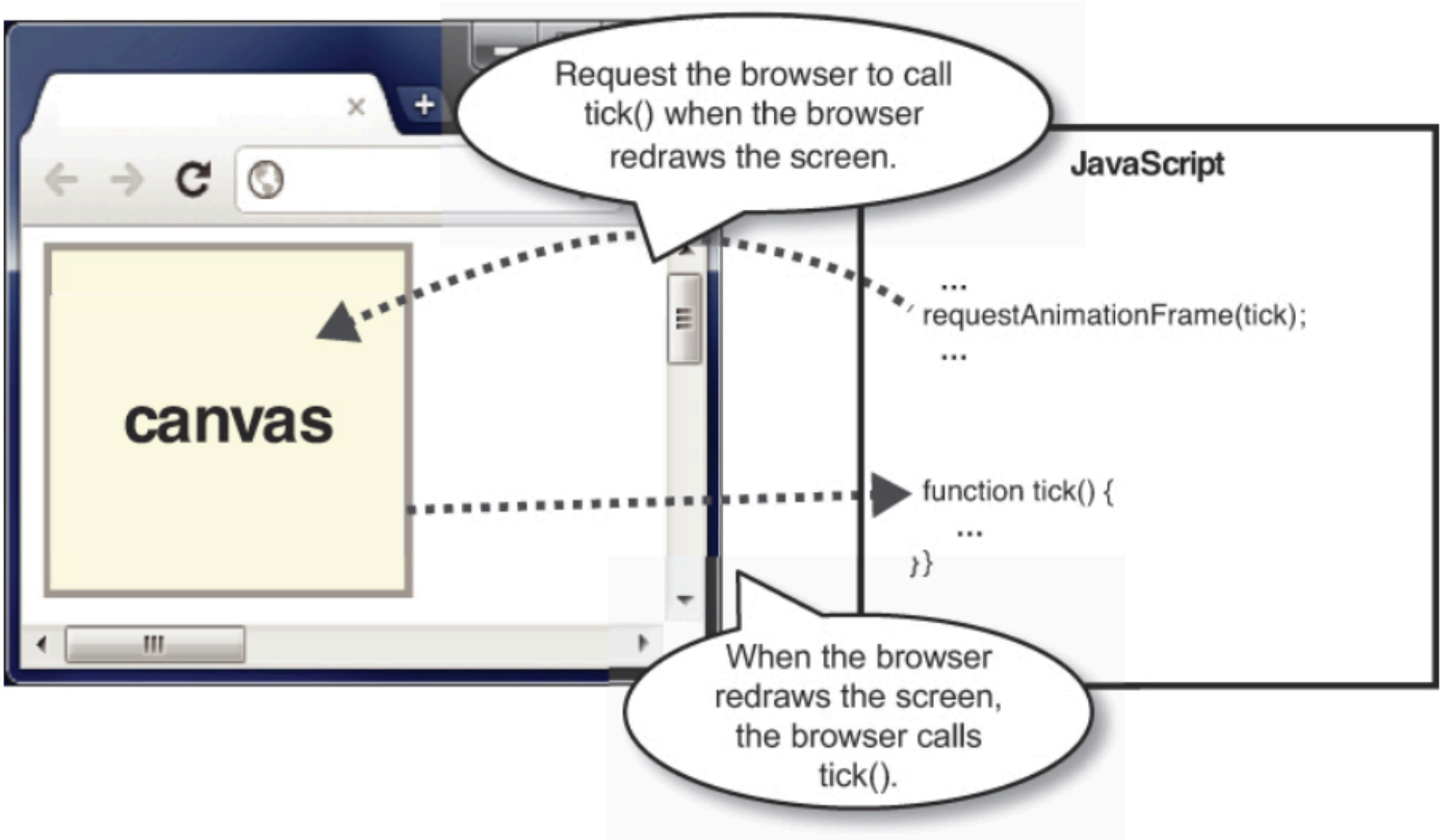
cancelAnimationFrame (requestID)

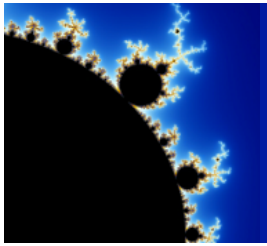
Cancel the function registered by `requestAnimationFrame()`.

Parameter	requestID	Specifies the return value of `requestAnimationFrame()`.
Return value	None	



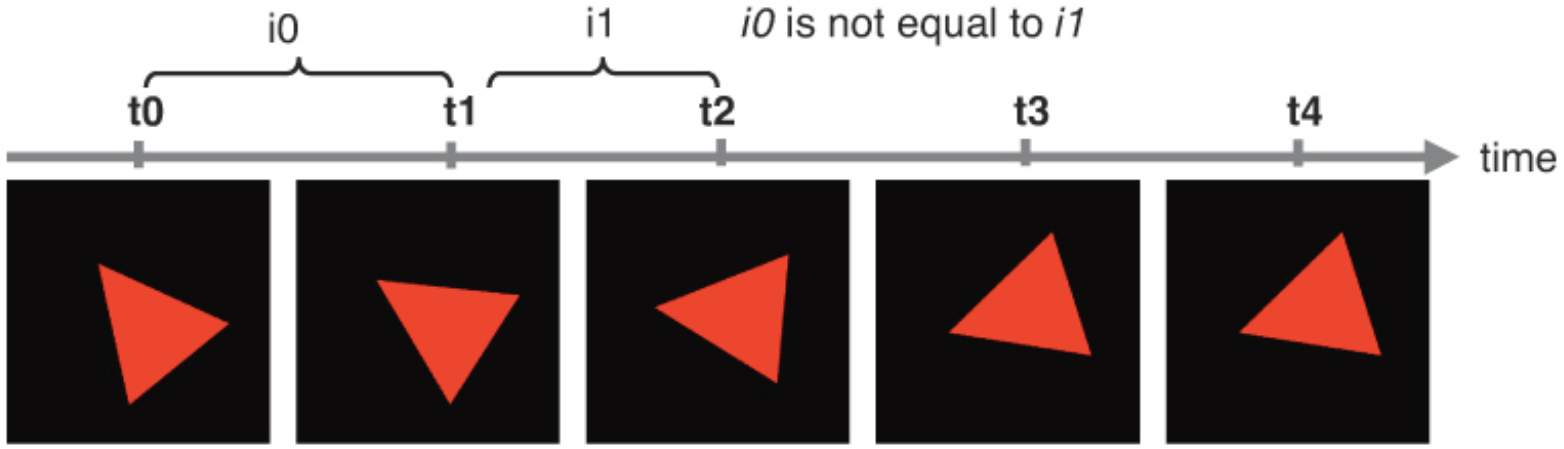
requestAnimationFrame(func)



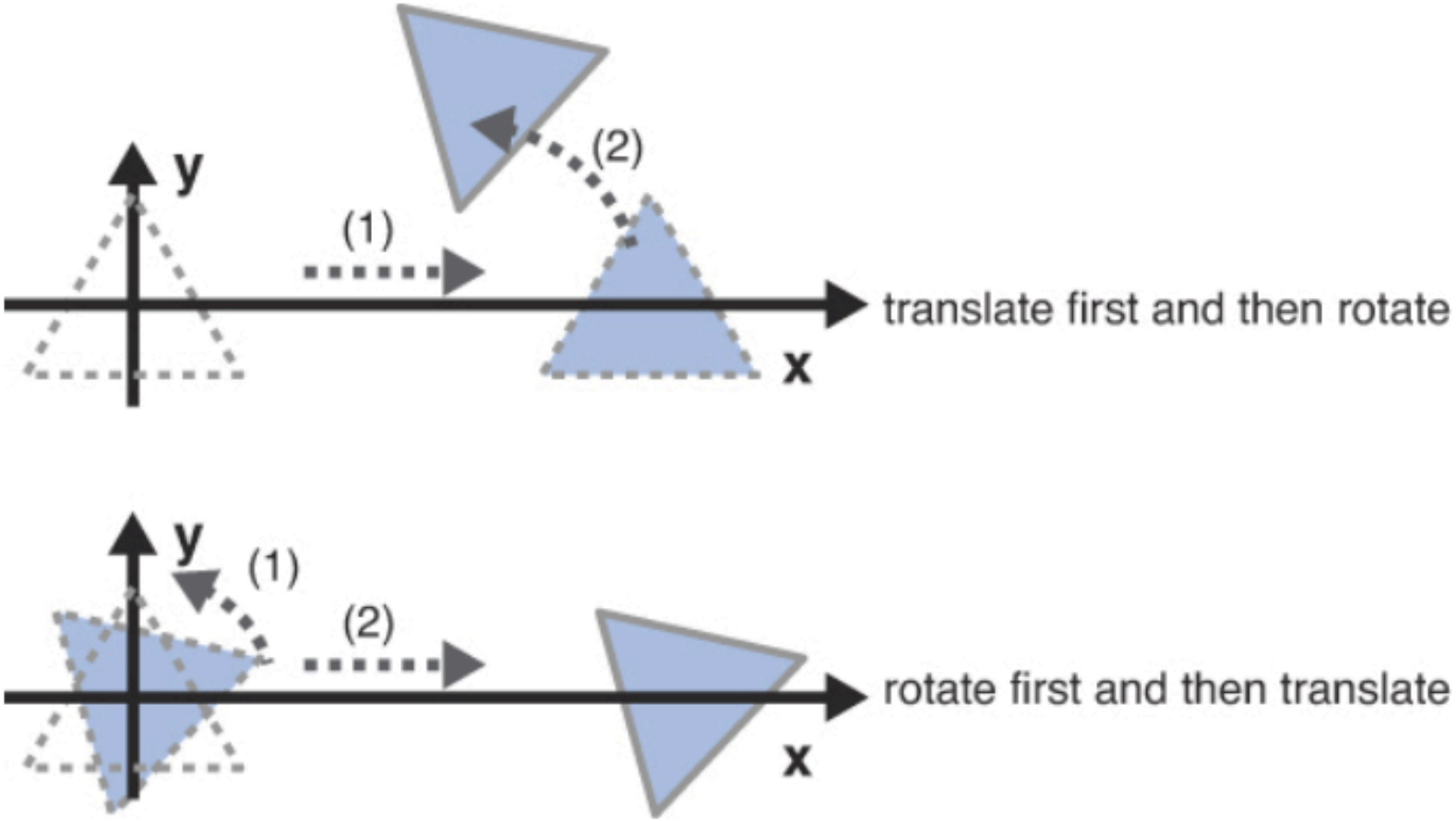


Obtain a constant speed rotation

```
var g_last = Date.getTime();
function animate(angle) {
  // Calculate the elapsed time
  var now = Date.getTime();
  var elapsed = now - g_last;
  g_last = now;
  // Update the current rotation angle (adjusted by the elapsed time)
  var newAngle = angle + (ANGLE_STEP * elapsed) / 1000.0;
  return newAngle %= 360;
}
```

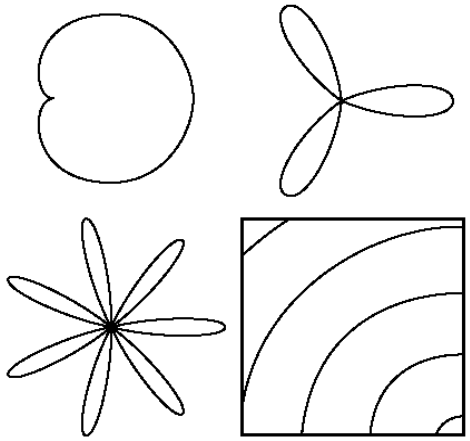


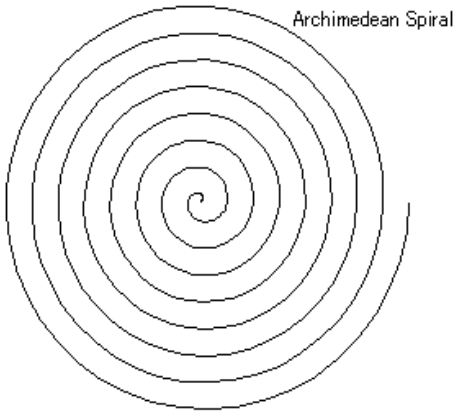
Animation with multiple transformations



animateTwoTransform Example

Parametric Curves





General form: $x = f(\theta)*\cos(\theta)$
$y = f(\theta)*\sin\theta$

cardioid: $f(\theta) = K*(1 + \cos(\theta))$, $0 \le \theta \le 2\pi$,
(K is a scale factor for the curves.)

rose: $f(\theta) = K* \cos(n*\theta)$, $0 \le \theta \le 2n\pi$,
where n is number of petals (n odd) or
twice the number of petals (n even)

spirals: Archimedean: $f(\theta) = K\theta$
Logarithmic: $f(\theta) = Ke^{a\theta}$