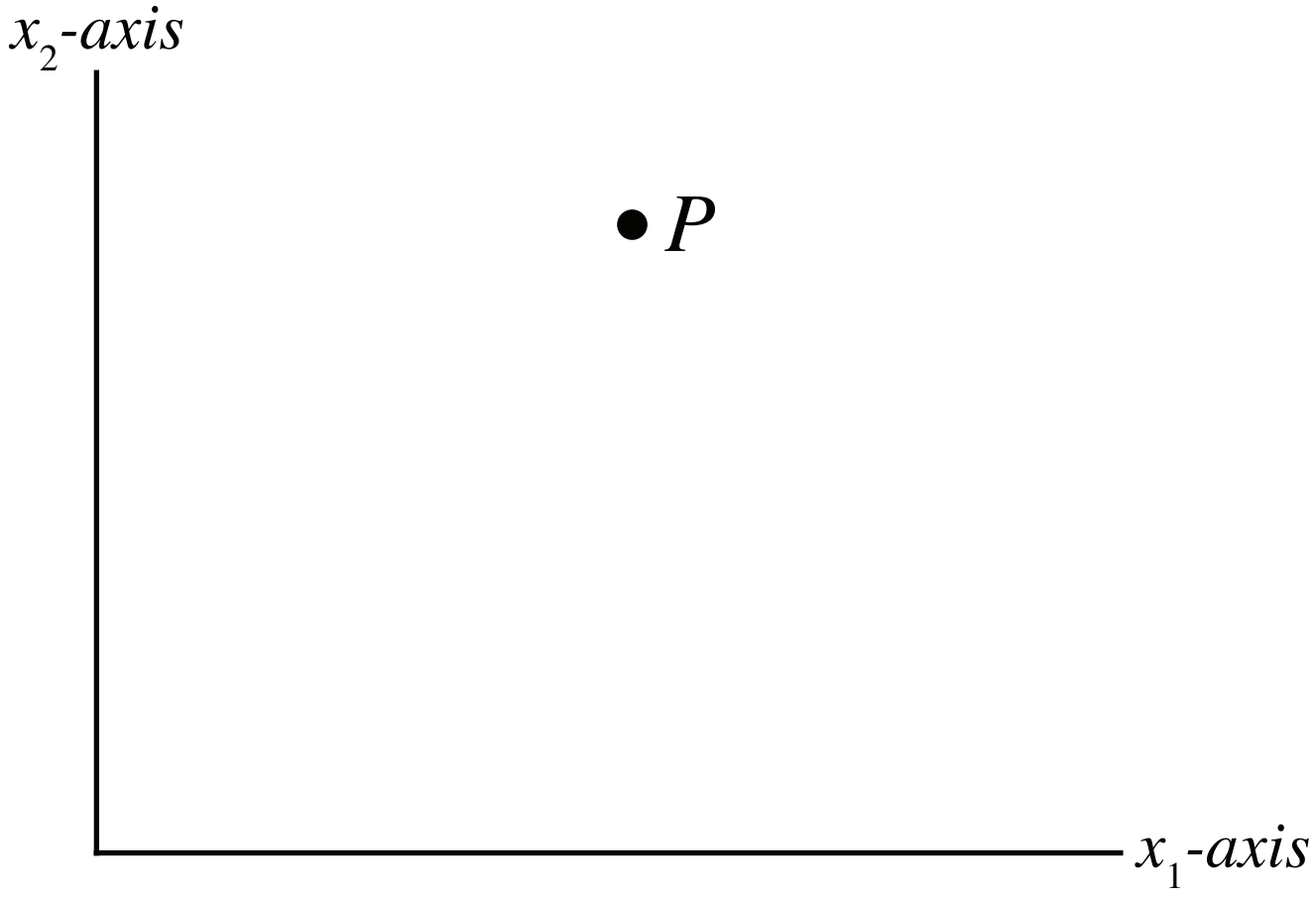
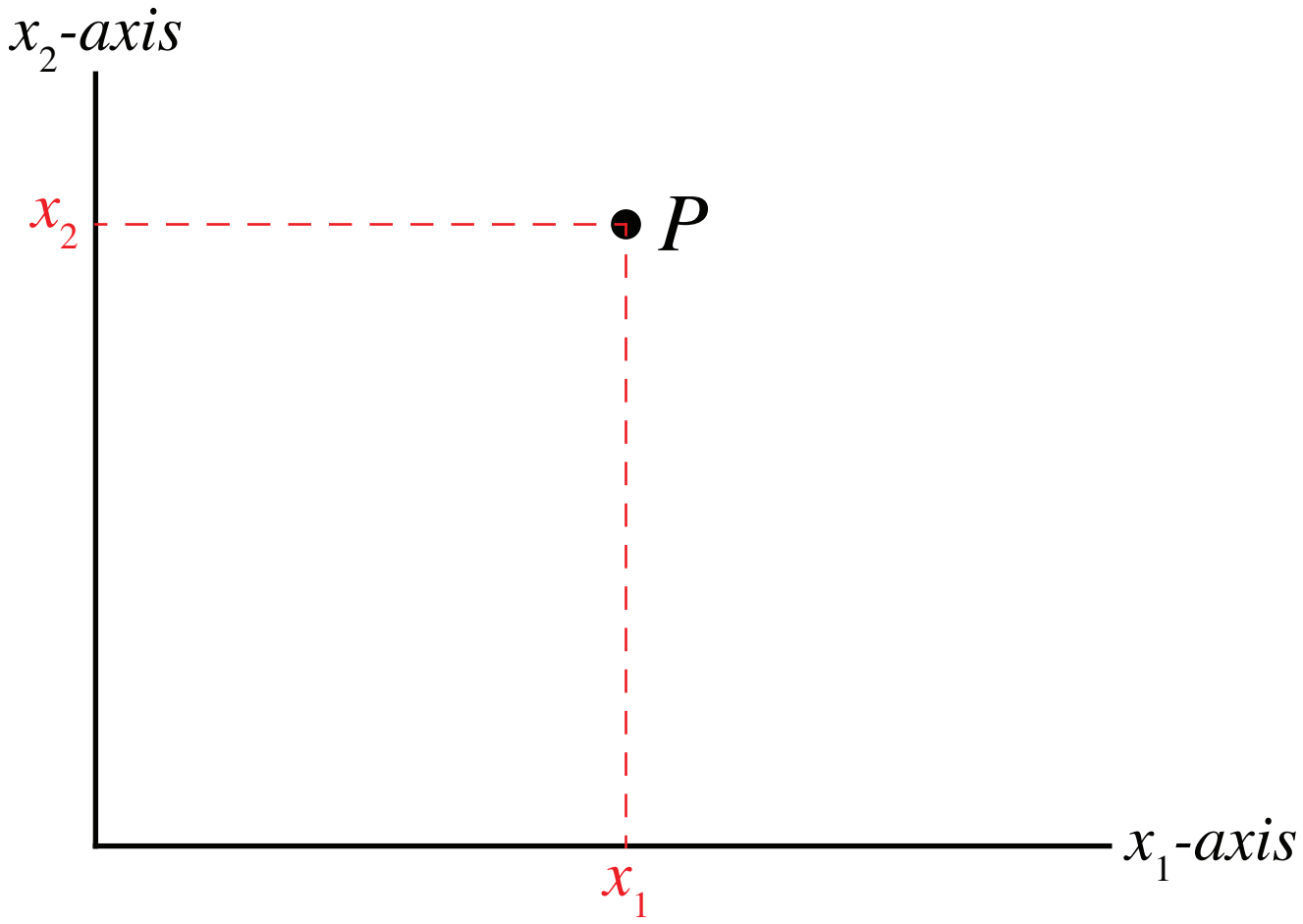
Coordinate Transformation (2–Dimensional)

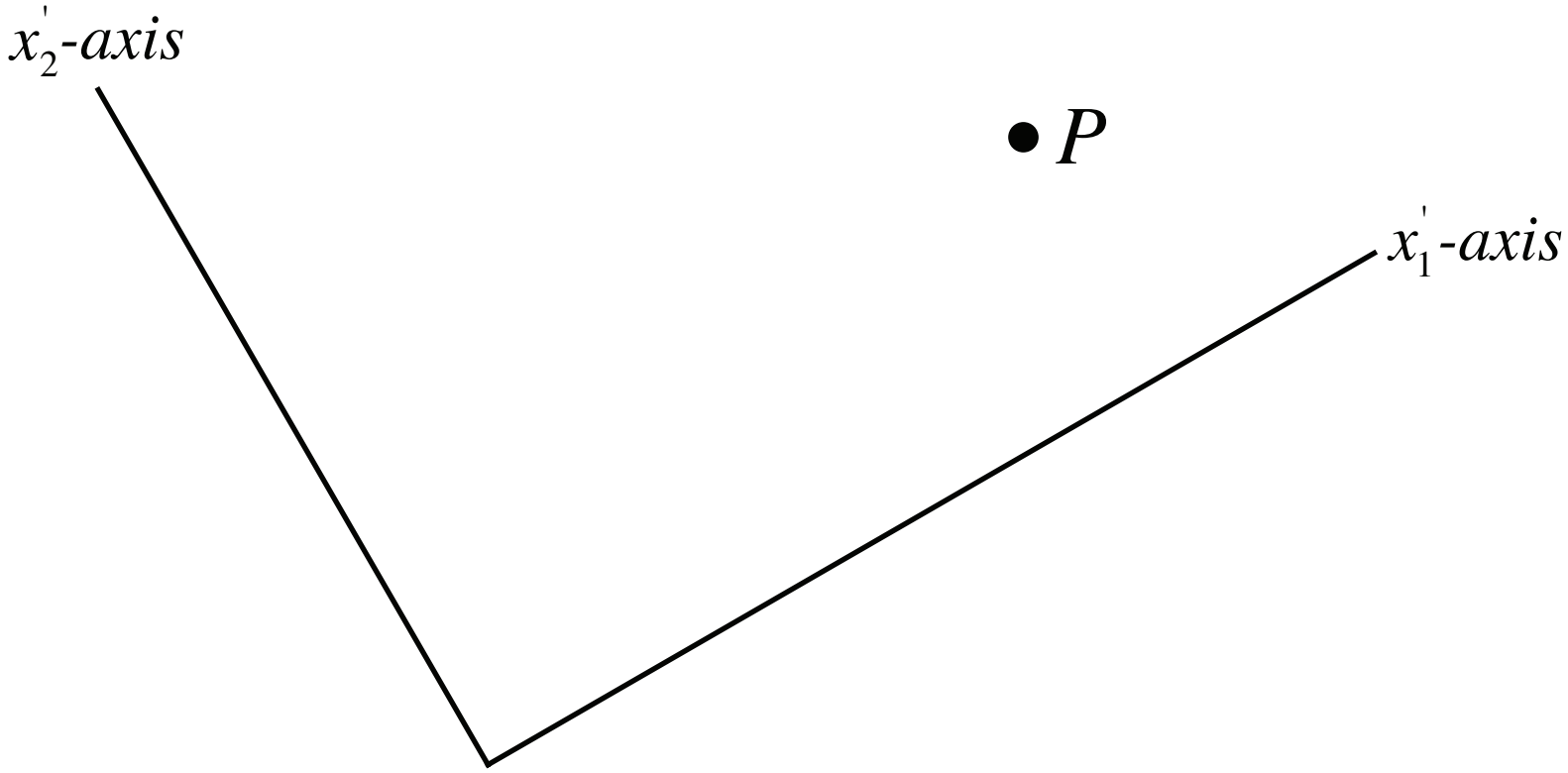
Coordinate Transformation (2–Dimensional)



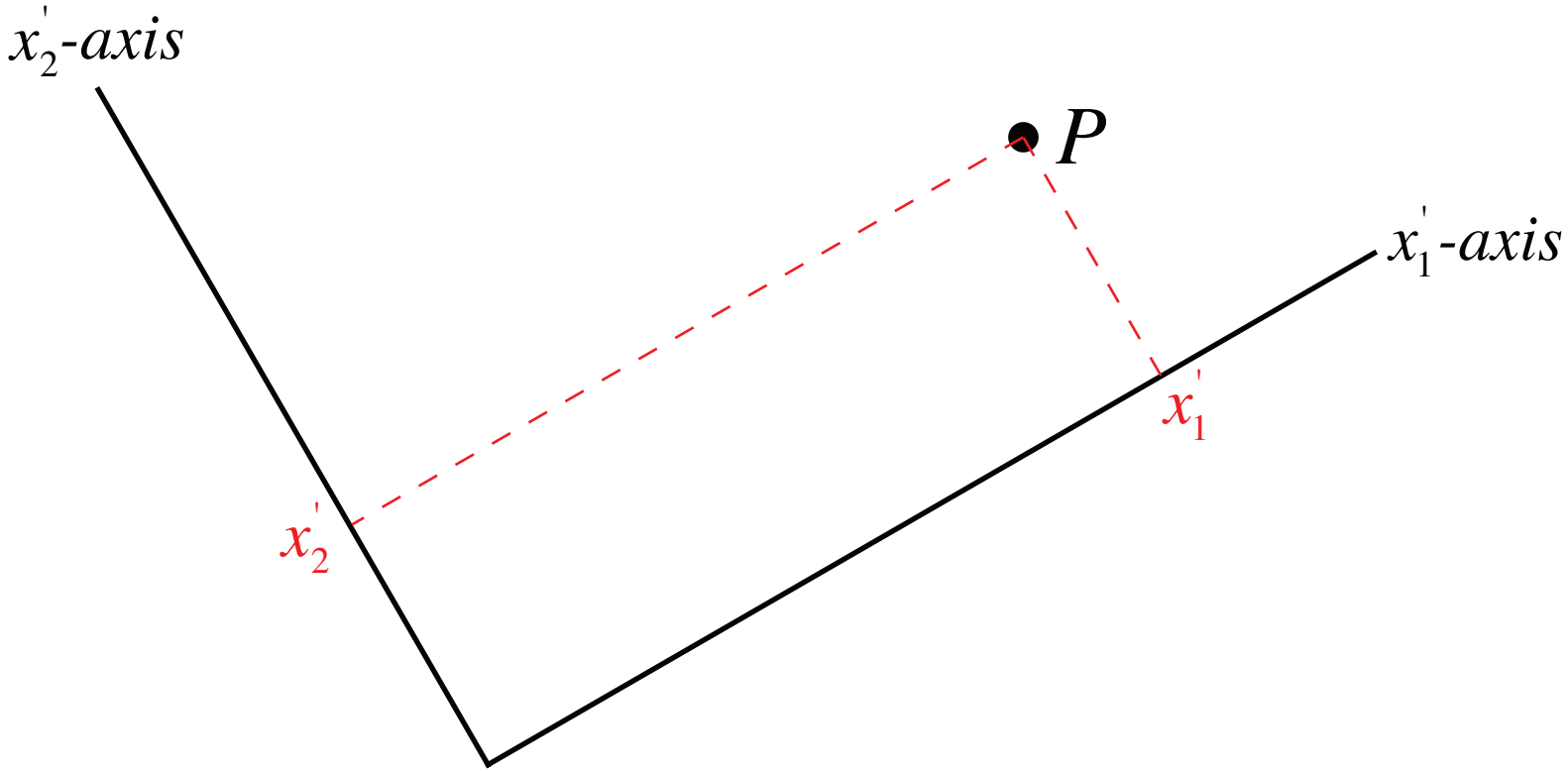
Coordinate Transformation (2–Dimensional)



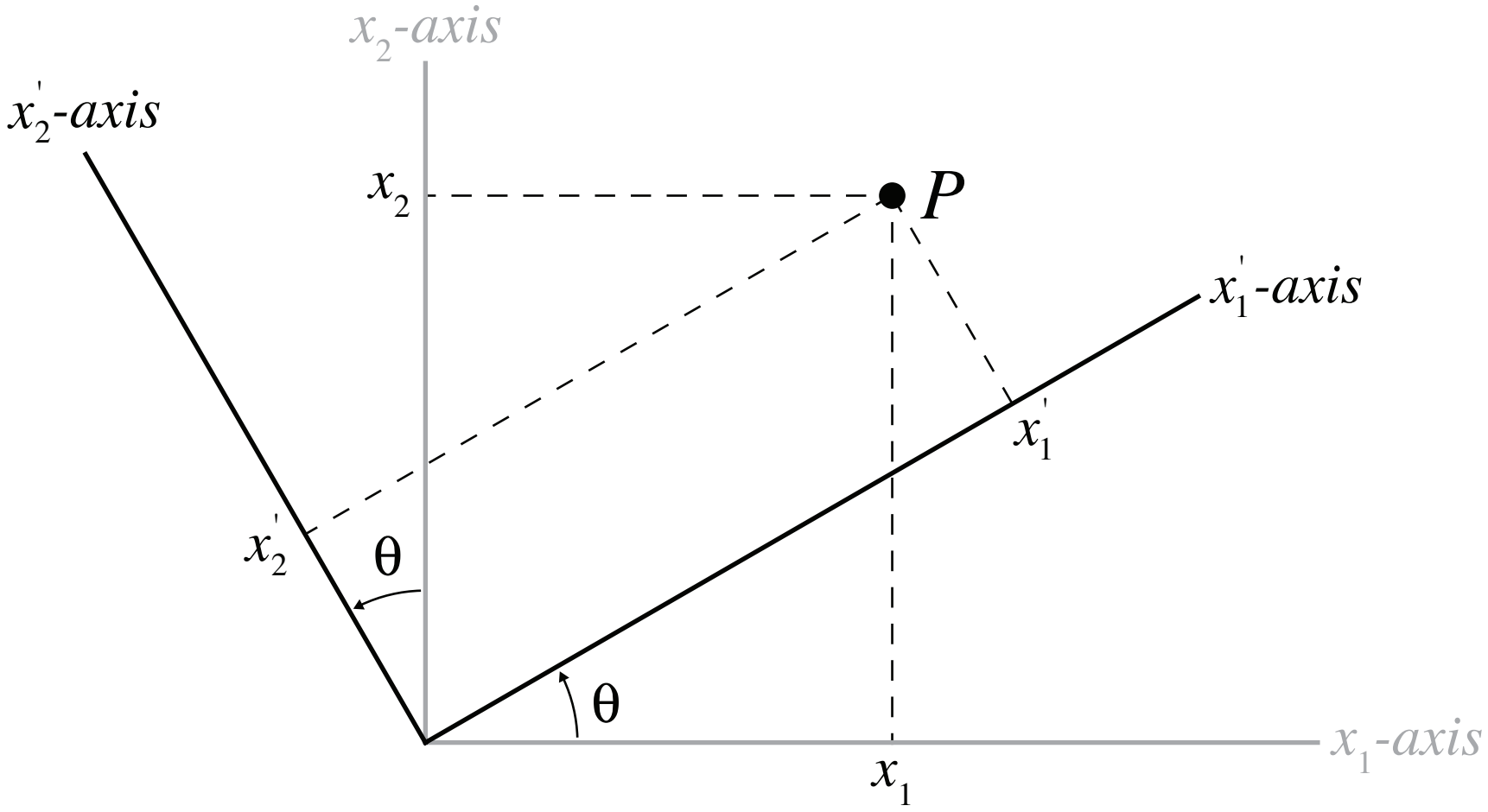
Coordinate Transformation (2–Dimensional)



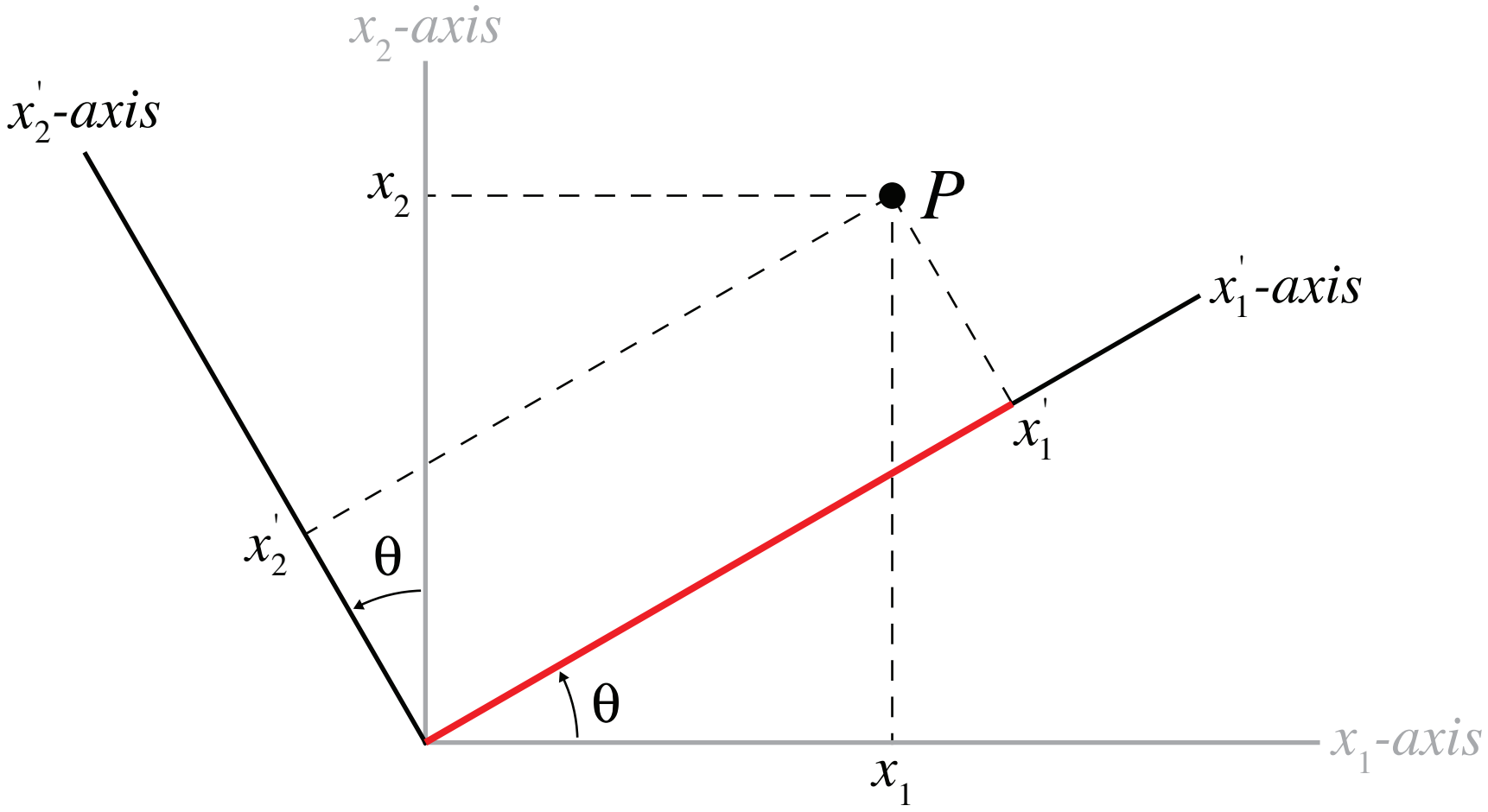
Coordinate Transformation (2–Dimensional)



Coordinate Transformation (2–Dimensional)

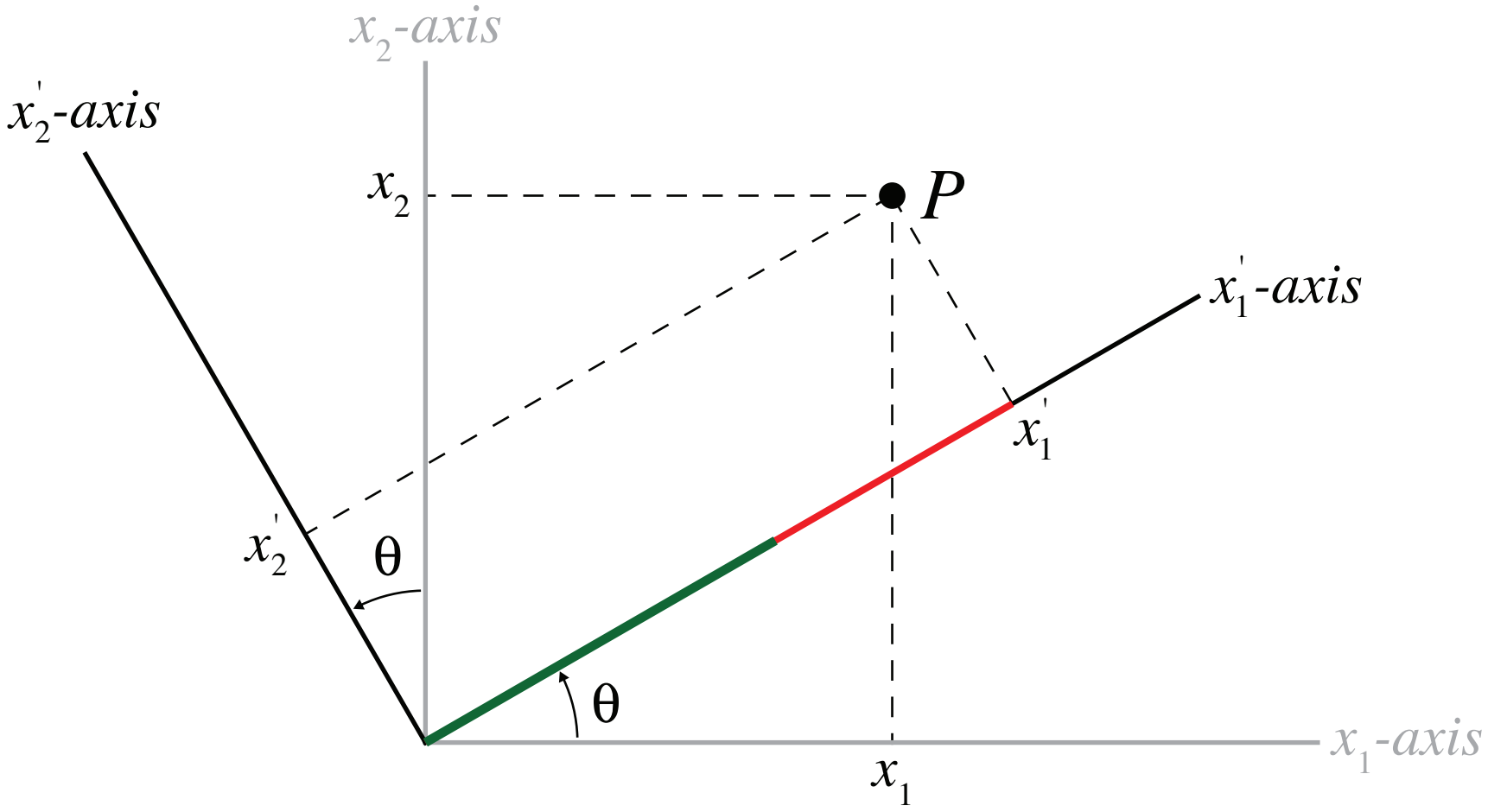


Coordinate Transformation (2–Dimensional)



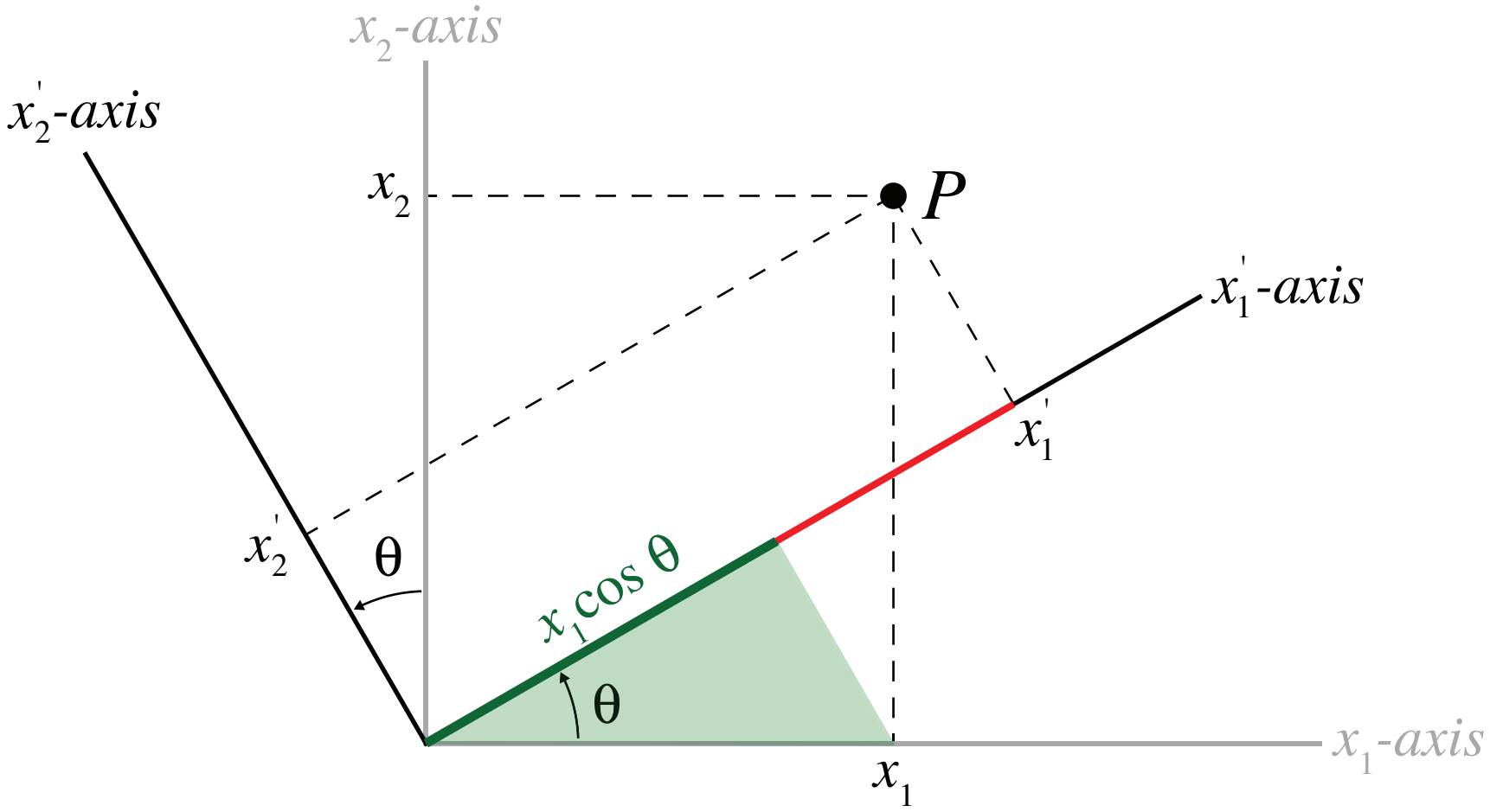
$$x'_1 =$$

Coordinate Transformation (2–Dimensional)



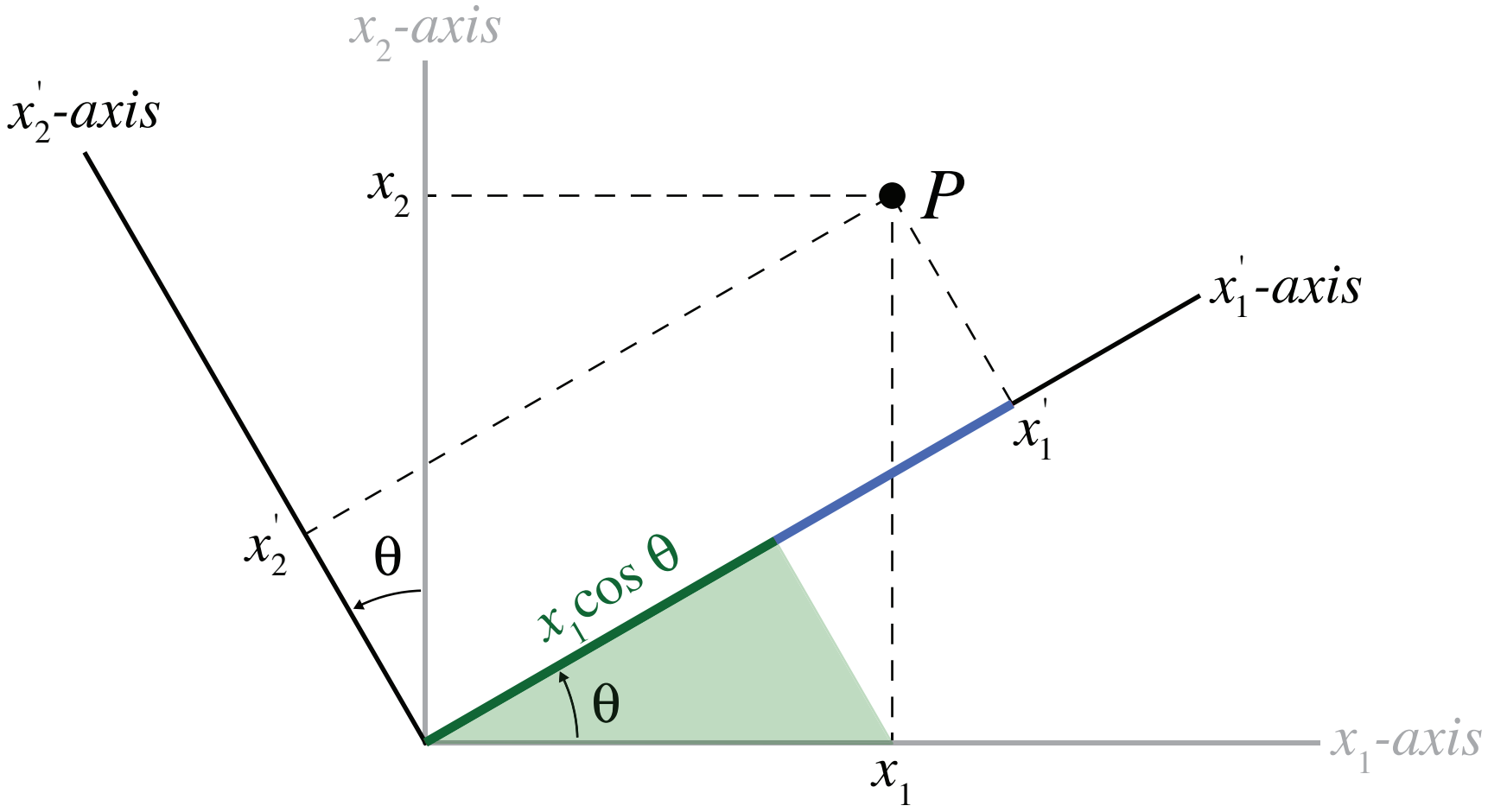
$$x'_1 =$$

Coordinate Transformation (2–Dimensional)



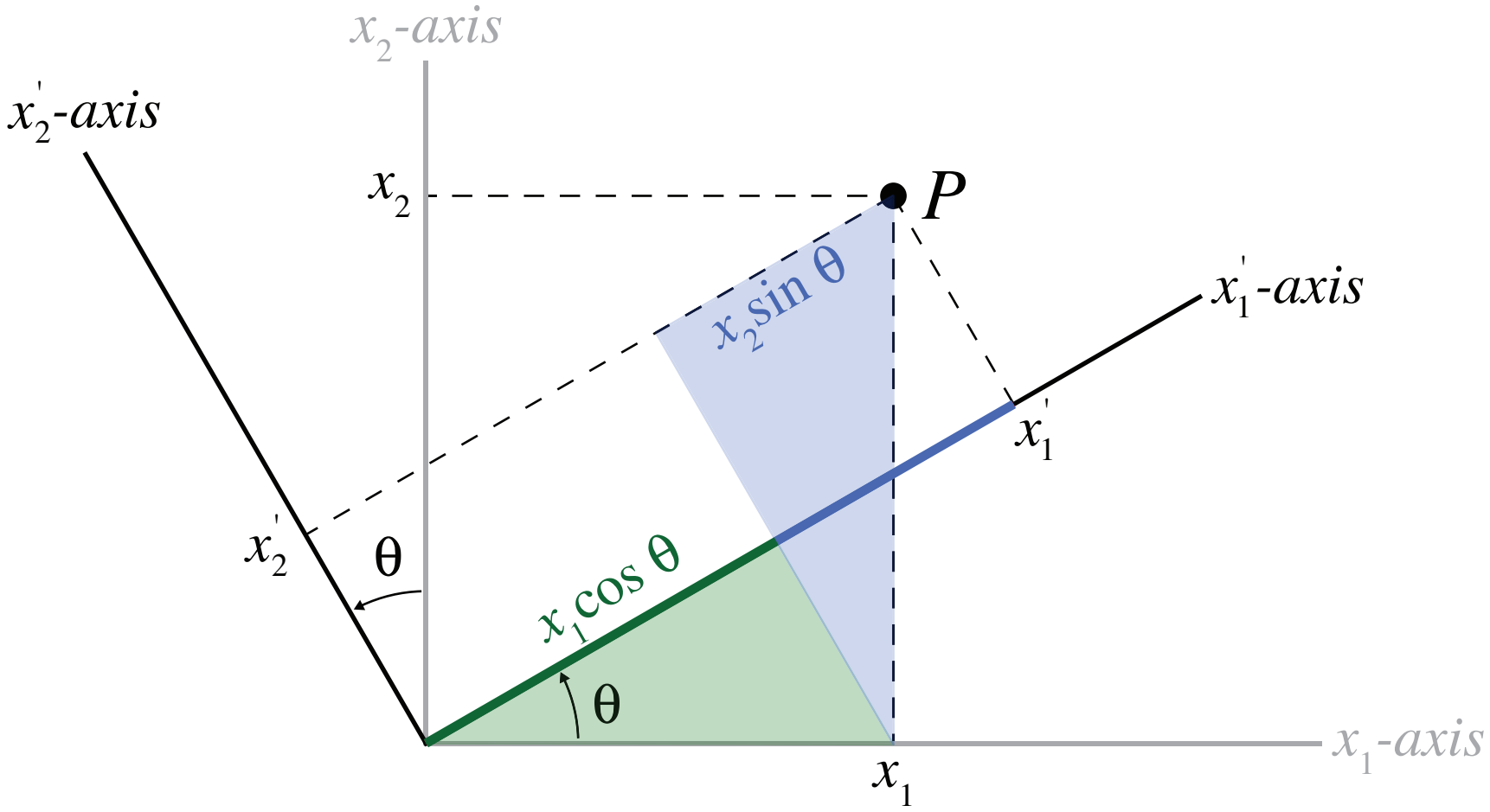
$$x'_1 = x_1 \cos\theta$$

Coordinate Transformation (2–Dimensional)



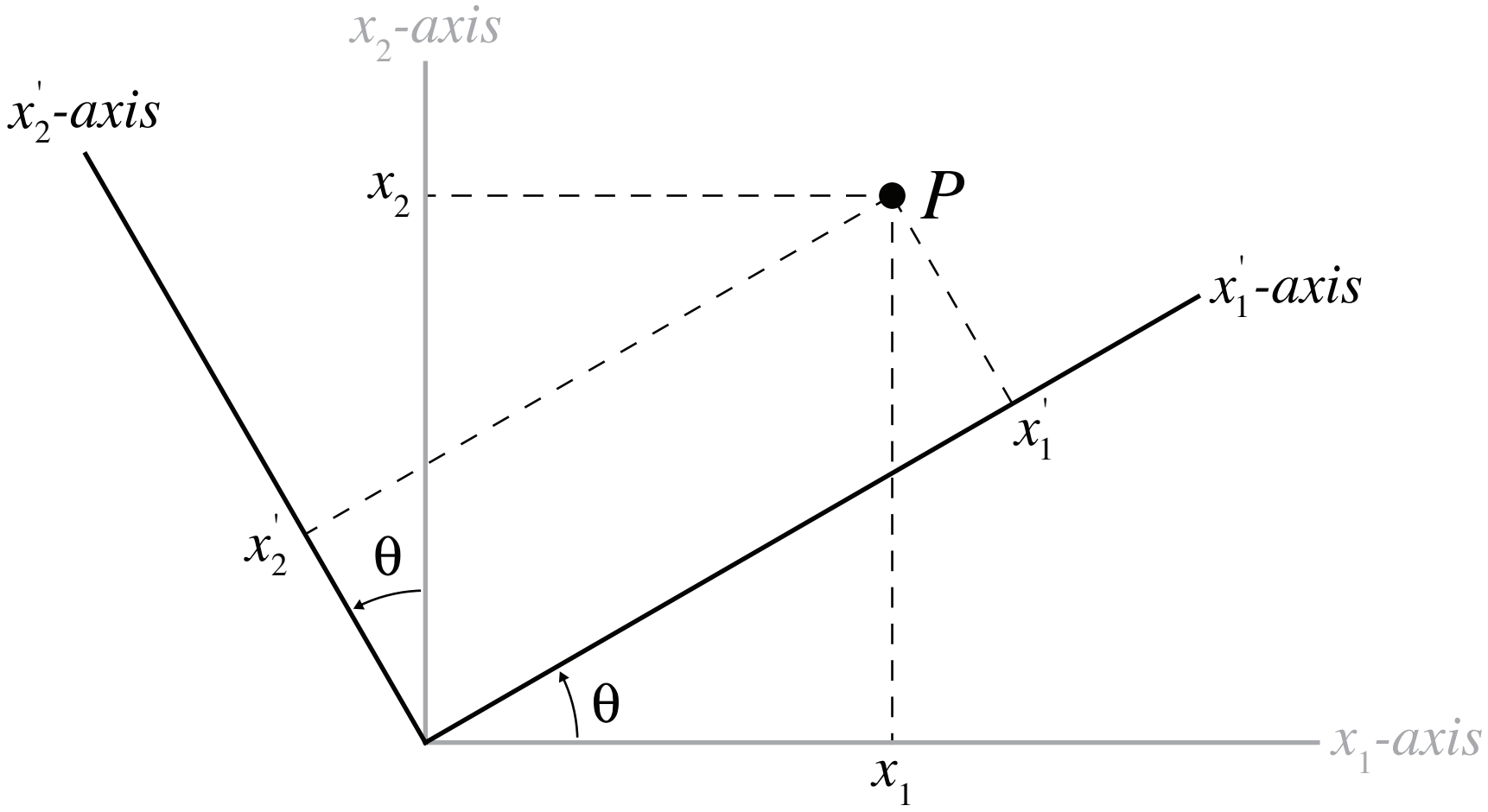
$$x'_1 = x_1 \cos\theta +$$

Coordinate Transformation (2–Dimensional)

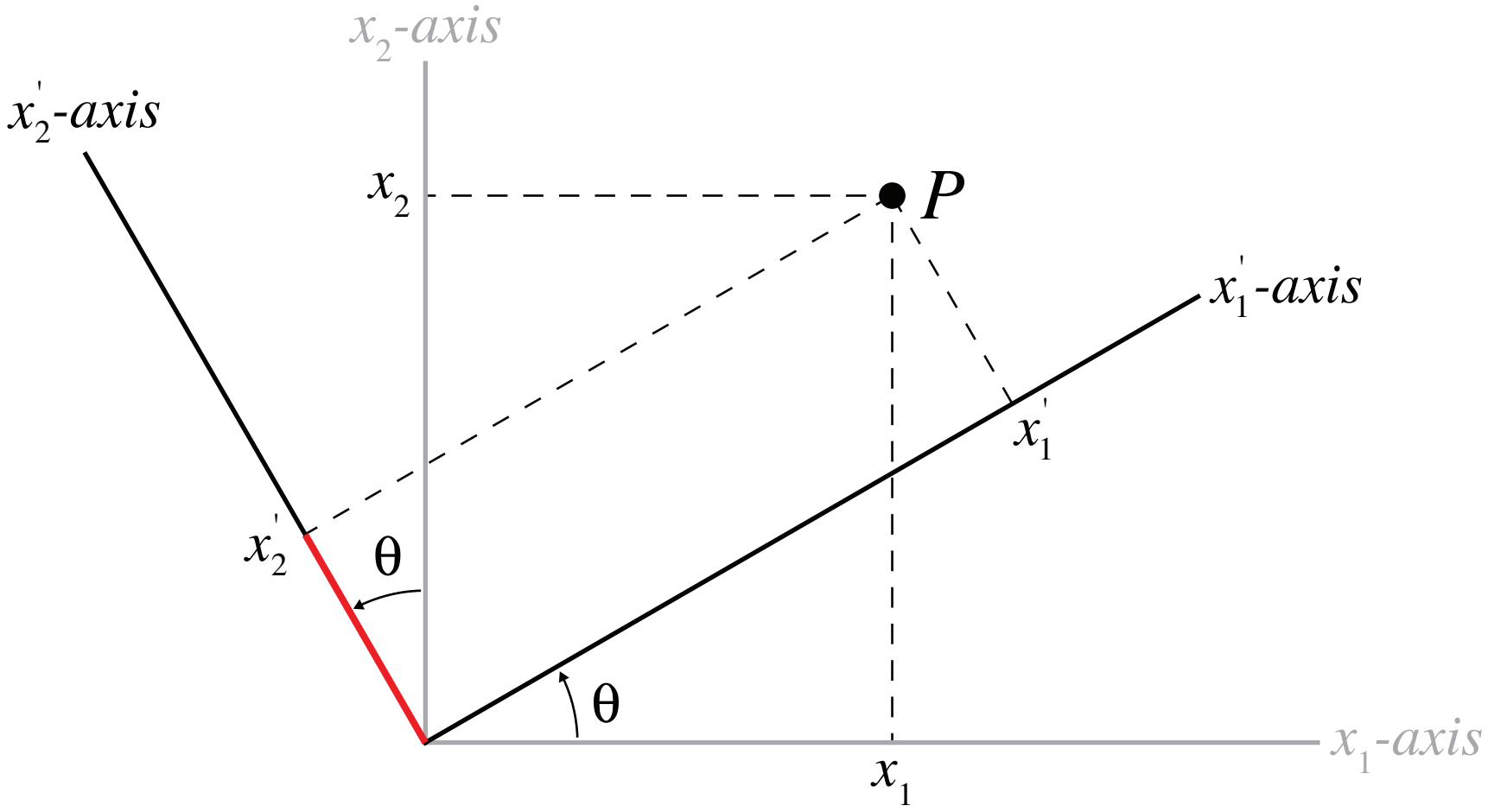


$$x'_1 = x_1 \cos\theta + x_2 \sin\theta$$

Coordinate Transformation (2–Dimensional)

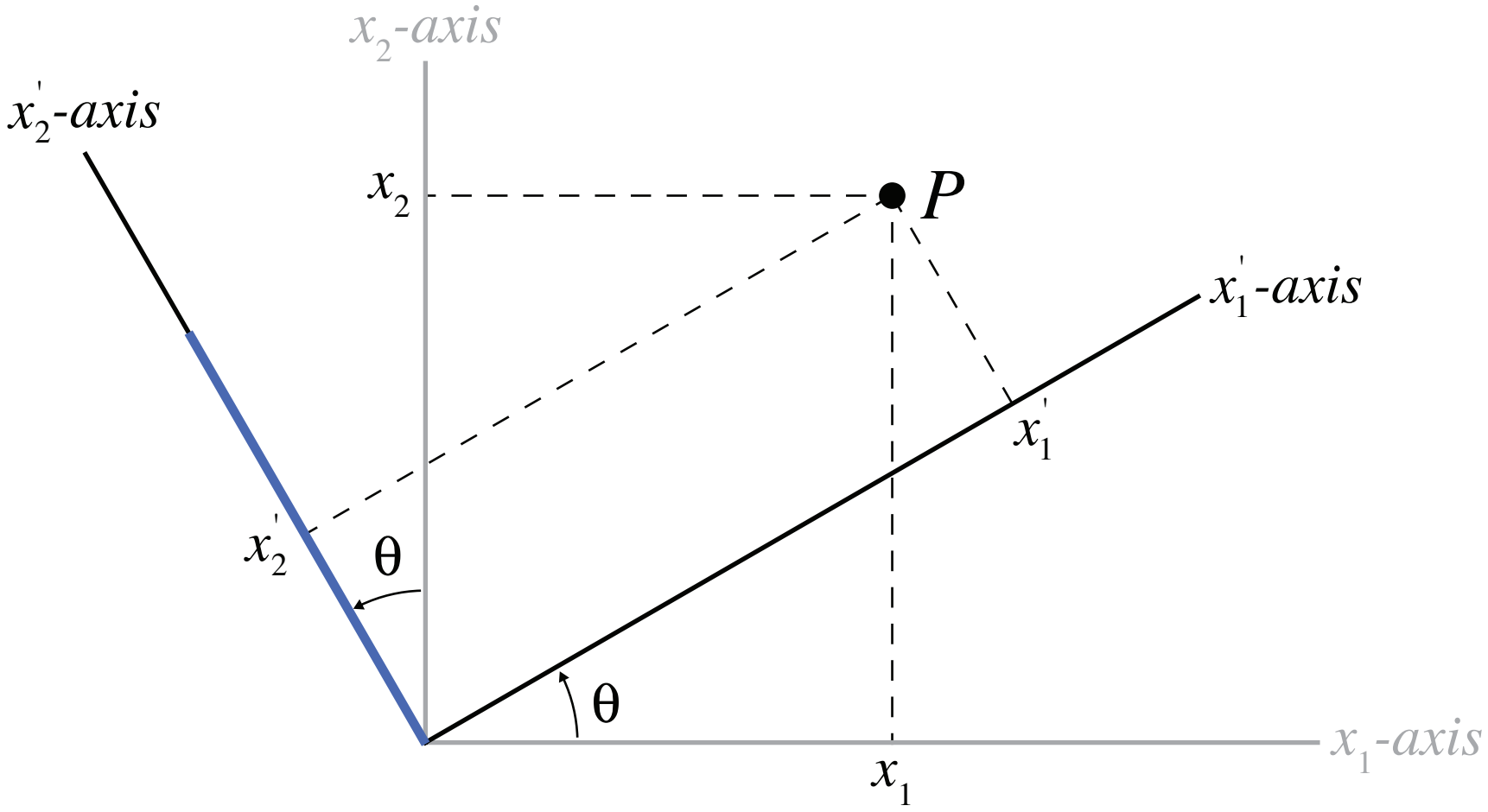


Coordinate Transformation (2–Dimensional)



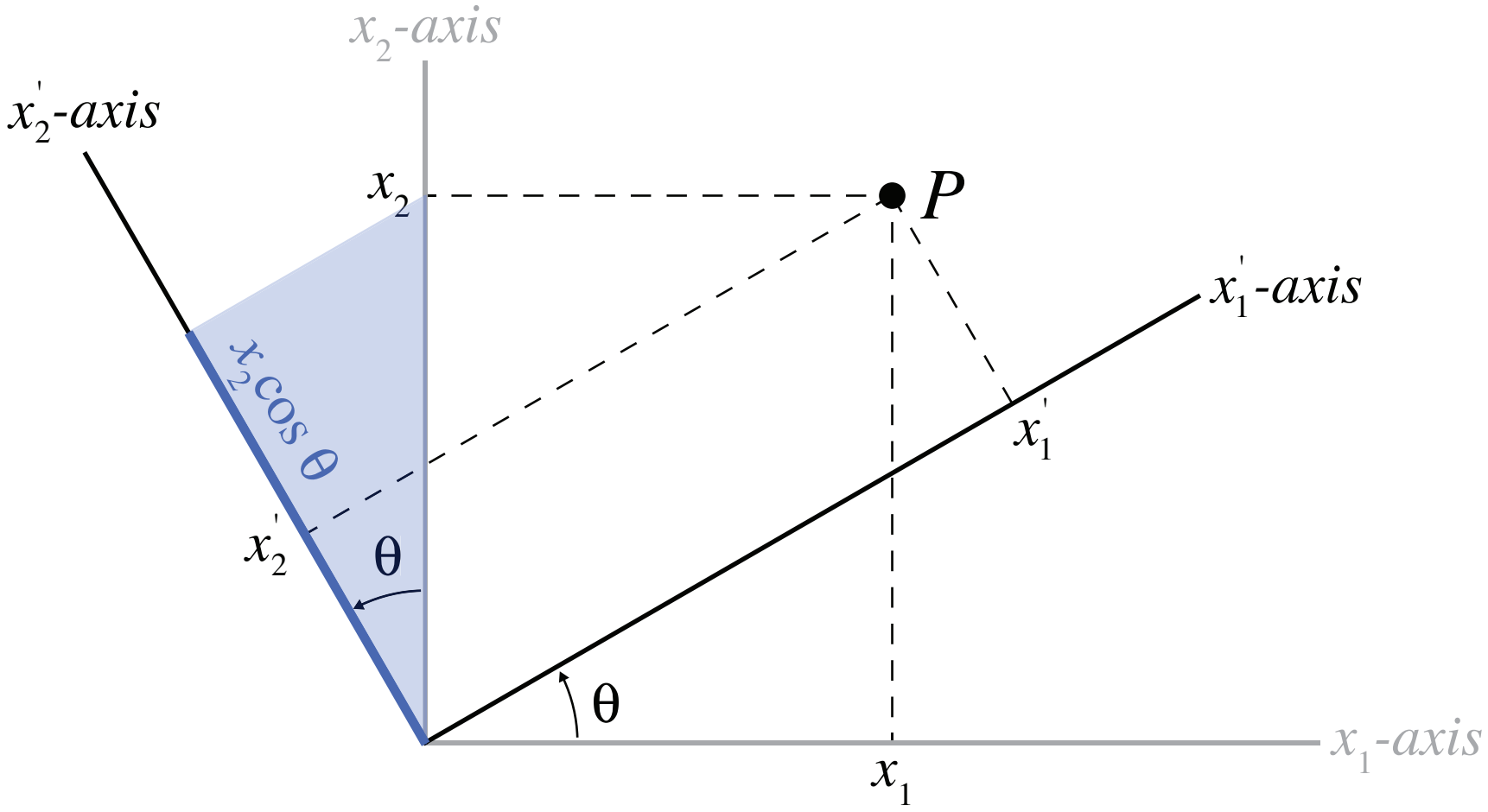
$$x'_2 =$$

Coordinate Transformation (2–Dimensional)



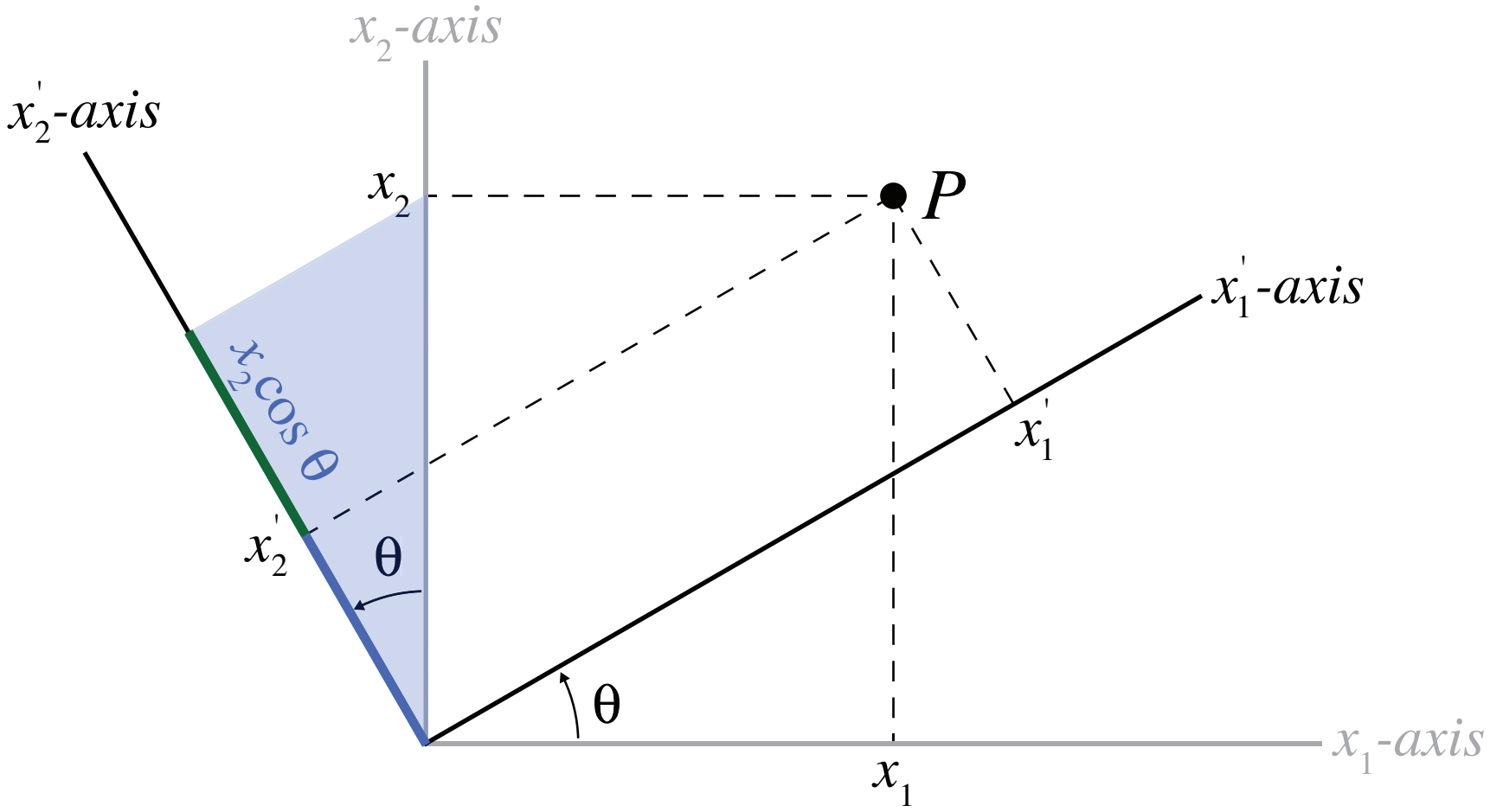
$$x'_2 =$$

Coordinate Transformation (2–Dimensional)



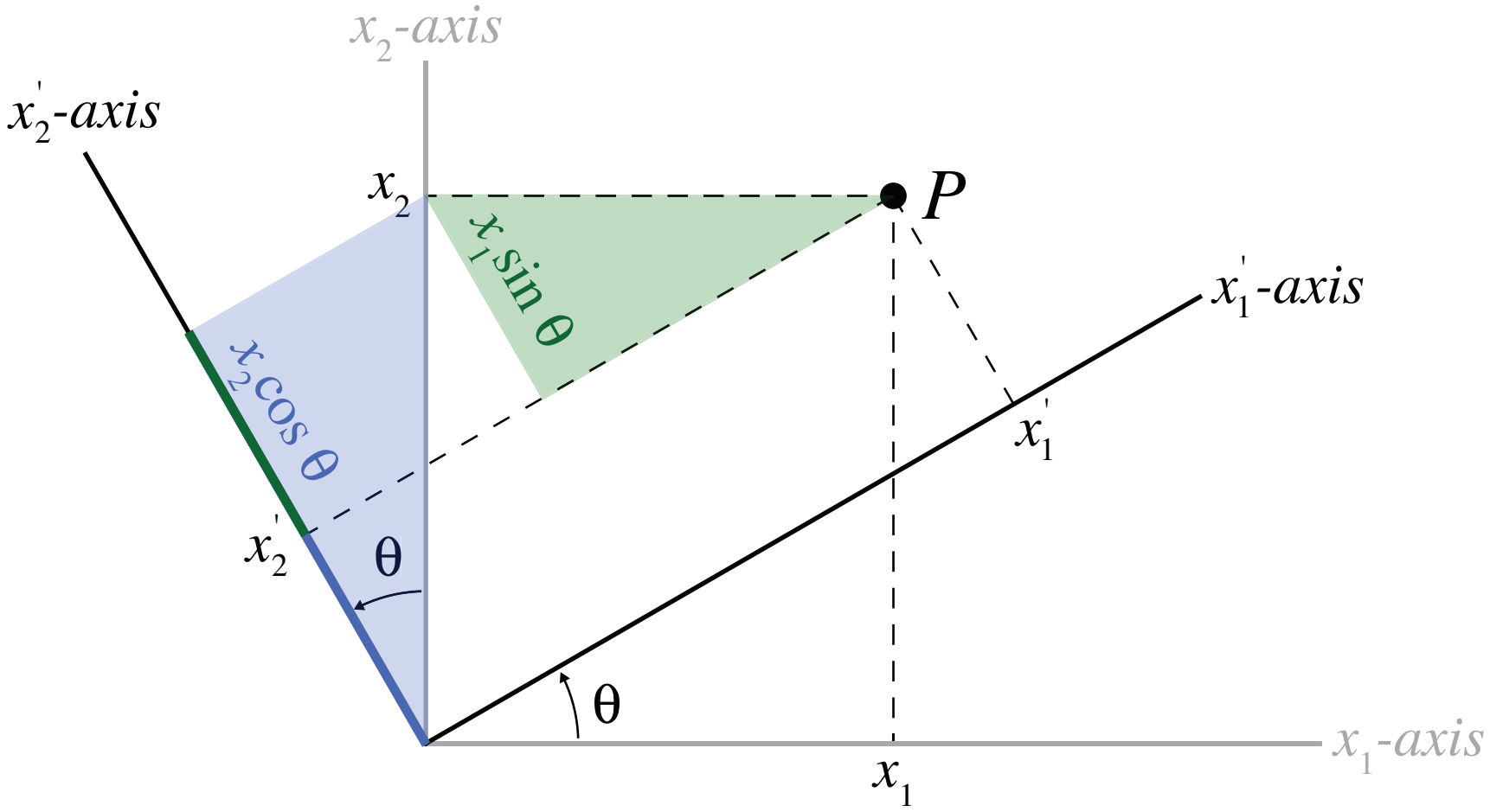
$$x'_2 = x_2 \cos\theta$$

Coordinate Transformation (2–Dimensional)



$$x'_2 = x_2 \cos\theta -$$

Coordinate Transformation (2–Dimensional)



$$x'_2 = x_2 \cos\theta - x_1 \sin\theta$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = \quad x_1 \cos\theta + x_2 \sin\theta$$

$$x'_2 = \quad x_2 \cos\theta - x_1 \sin\theta$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = \quad x_1 \cos\theta + x_2 \sin\theta$$

$$x'_2 = -x_1 \sin\theta + x_2 \cos\theta$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = \quad x_1 \cos\theta + x_2 \sin\theta$$
$$x'_2 = -x_1 \sin\theta + x_2 \cos\theta$$

But

$$\sin\theta = \cos\left(\theta - \frac{\pi}{2}\right)$$
$$-\sin\theta = \cos\left(\theta + \frac{\pi}{2}\right)$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = x_1 \cos\theta + x_2 \cos\left(\theta - \frac{\pi}{2}\right)$$

$$x'_2 = x_1 \cos\left(\theta + \frac{\pi}{2}\right) + x_2 \cos\theta$$

But

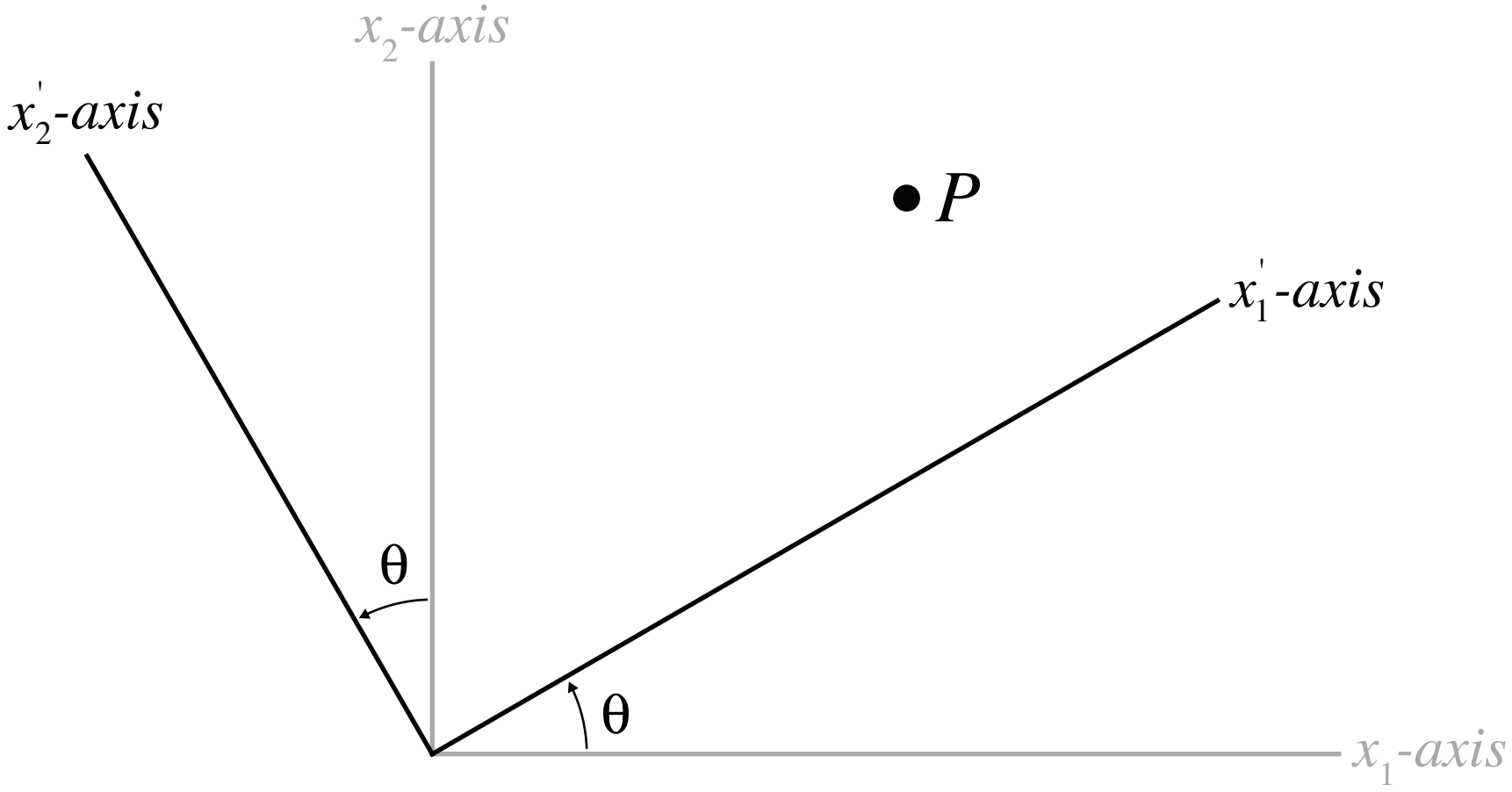
$$\cos(\beta) = \cos(-\beta)$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = \quad x_1 \cos\theta + x_2 \cos\left(\frac{\pi}{2} - \theta\right)$$

$$x'_2 = \quad x_1 \cos\left(\frac{\pi}{2} + \theta\right) + x_2 \cos\theta$$

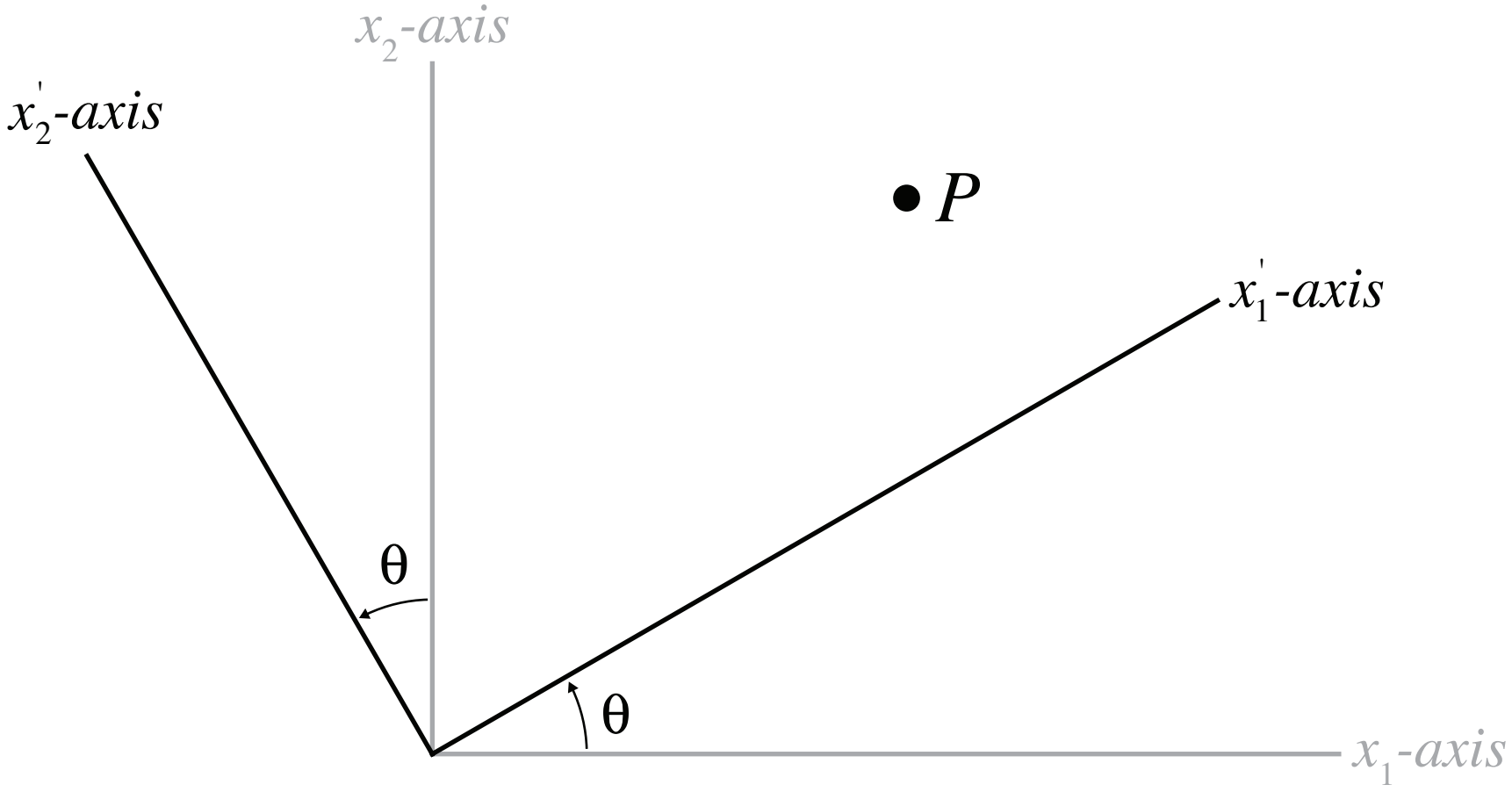
Coordinate Transformation (2–Dimensional)



$$\theta = \left(x'_1, x_1\right) = angle\ between\ x'_1\ \&\ x_1\ axis$$

$$\theta = \left(x'_2, x_2\right) = angle\ between\ x'_2\ \&\ x_2\ axis$$

Coordinate Transformation (2–Dimensional)



$$\pi/2-\theta=\left(x'_1,x_2\right)=angle\ between\ x'_1\ \&\ x_2\ axis$$

$$\pi/2+\theta=\left(x'_2,x_1\right)=angle\ between\ x'_2\ \&\ x_1\ axis$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = x_1 \cos\left(x'_1, x_1\right) + x_2 \cos\left(x'_1, x_2\right)$$

$$x'_2 = x_1 \cos\left(x'_2, x_1\right) + x_2 \cos\left(x'_2, x_2\right)$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = x_1\lambda_{11} + x_2\lambda_{12}$$
$$x'_2 = x_1\lambda_{21} + x_2\lambda_{12}$$

Coordinate Transformation (2–Dimensional)

$$x'_1 = \lambda_{11} x_1 + \lambda_{12} x_2$$
$$x'_2 = \lambda_{21} x_1 + \lambda_{22} x_2$$

Coordinate Transformation (3–Dimensional)

$$
\begin{aligned}
x'_1 &= \lambda_{11}x_1 + \lambda_{12}x_2 + \lambda_{13}x_3 \\
x'_2 &= \lambda_{21}x_1 + \lambda_{22}x_2 + \lambda_{23}x_3 \\
x'_3 &= \lambda_{31}x_1 + \lambda_{32}x_2 + \lambda_{33}x_3
\end{aligned}
$$

$$
x'_i = \lambda_{ij}x_j
$$