$$e^{-j\theta} = \overline{e^{j\theta}}$$

Let $\theta = 2\pi \cdot \left(\frac{ux}{M} + \frac{vy}{N}\right)$

DFT: $F(u,v) = \sum_{x=0}^{M-1} \sum_{y=0}^{N-1} f(x,y) \cdot \exp\left(-j2\pi\left(\frac{ux}{M} + \frac{vy}{N}\right)\right)$

IDFT: $f(x,y) = \frac{1}{MN} \sum_{u=0}^{M-1} \sum_{v=0}^{N-1} F(u,v) \exp\left(j2\pi\left(\frac{ux}{M} + \frac{vy}{N}\right)\right)$

With conjugate of $F(u,v)$, we turn j into negative and get:

$$\overline{F(u,v)} = \sum_{x=0}^{M-1} \sum_{y=0}^{N-1} f(x,y) \cdot \exp\left(j2\pi\left(\frac{ux}{M} + \frac{vy}{N}\right)\right)$$

$$= \sum_{x=0}^{M-1} \sum_{y=0}^{N-1} f(x,y) \cdot \exp\left(-j2\pi\left(\frac{(2M-u)x}{M} + \frac{(2N-v)y}{N}\right)\right)$$

$$= F(2M-u, 2N-v)$$

$0 \quad 1 \quad 2 \quad \cdots \quad M-1$

$0 \quad -1 \quad -2 \quad \cdots \quad -M+1 \; +2M.$

Using IDFT:

$$f'(x,y) = \frac{1}{MN} \sum_{u=0}^{M-1} \sum_{v=0}^{N-1} \overline{F(u,v)} \cdot \exp\left(j2\pi\left(\frac{ux}{M} + \frac{vy}{N}\right)\right)$$

$$= \frac{1}{MN} \sum_{u=0}^{M-1} \sum_{v=0}^{N-1} F(2M-u, 2N-v) \exp\left(j2\pi\left(\frac{ux}{M} + \frac{vy}{N}\right)\right)$$

$u = 2M - u'$

$$= \frac{1}{MN} \sum_{u'=0}^{M+1} \sum_{v'=0}^{N+1} F(u', v') \exp\left(j2\pi\left(\frac{(2M-u')x}{M} + \frac{(2N-v')y}{N}\right)\right)$$

$u' = 0$

$u' = -u + 2M$

$$= \frac{1}{MN} \sum_{u'=0}^{M+1} \sum_{v'=0}^{N+1} F(u', v') \exp\left(j2\pi\left(\frac{-u'x}{M} + \frac{-v'y}{N}\right)\right)$$

$$= \frac{1}{MN} \sum_{u'=0}^{M+1} \sum_{v'=0}^{N+1} F(u', v') \exp\left(-j2\pi\left(\frac{u'x}{M} + \frac{v'y}{N}\right)\right)$$

$$= \frac{1}{MN} \sum_{u'=0}^{M+1} \sum_{v'=0}^{N+1} F(u', v') \cdot \exp\left(j2\pi\left(\frac{-u'x}{M} + \frac{-v'y}{N}\right)\right)$$

$$= \frac{1}{MN} \sum_{u'=0}^{M-1} \sum_{v'=0}^{N-1} F(u', v') \cdot \exp\left(j2\pi\left(\frac{u'(M-x)}{M} + \frac{v'(N-y)}{N}\right)\right)$$

$$= f(M-x, N-y)$$

Therefore, applying IDFT to the conjugate of DFT of an image flips the image along both x and y axes.