STAGE 2

$B(2) = [A(0) - A(2)] W_8^0 = [1-0](1) = 1$

$B(3) = [A(1) - A(3)] W_8^2 = [1-0][-j] = -j$

$B(0) = [A(0) + A(2)] = 1$

$B(1) = A(1) + A(3) = 1$

$B(4) = A(4) + A(6) = 1 + 0$

$B(5) = A(5) + A(7) = \frac{\sqrt{2}}{2} - j\frac{\sqrt{2}}{2} + 0$

$B(6) = [A(4) - A(6)] W_8^0 = (1)(1)$

$B(7) = [A(5) - A(7)] W_8^2 = \left(\frac{\sqrt{2}}{2} - j\frac{\sqrt{2}}{2}\right)(-j) = -\frac{\sqrt{2}}{2} - j\frac{\sqrt{2}}{2}$

STAGE 3

$X(0) = B(0) + B(1) = 1 + 1 = 2$

$X(4) = [B(0) - B(1)] W_8^0 = [1-1][1] = 0$

$X(2) = [B(2) + B(3)] = 1 - j$

$X(6) = [B(2) - B(3)] W_8^0 = (1+j)(1) = 1 + j$

$X(1) = B(4) + B(5) = \left(1 + \frac{\sqrt{2}}{2}\right) - j\frac{\sqrt{2}}{2}$

$X(5) = [B(4) - B(5)] W_8^0 = \left[1 - \frac{\sqrt{2}}{2} + j\frac{\sqrt{2}}{2}\right][1] = \left(1 - \frac{\sqrt{2}}{2}\right) + j\frac{\sqrt{2}}{2}$

$X(3) = B(6) + B(7) = \left(1 - \frac{\sqrt{2}}{2}\right) - j\frac{\sqrt{2}}{2}$

$X(7) = [B(6) - B(7)] W_8^0 = \left(1 + \frac{\sqrt{2}}{2}\right) + j\frac{\sqrt{2}}{2}$

(B) The main advantage of FFT VS. DFT is the amount of time to compute. complexity for FFT is $\frac{N}{2}\log_2 N$ VS. N^2 for DFT.