Assume the data is normal distribution. Then $\bar{X} = 1.36$, and 0.05 quantile for unit normal is 1.645, the 90% confidence interval is to be:

$$1.36 \pm \frac{0.4 \times 1.645}{\sqrt{9}} = (1.141, 1.579)$$

If $\sigma$ is unknown, we have to use t distribution with estimated $\sigma$ to complete the job. The estimator $\hat{\sigma} = 0.32$, so the 90% confidence interval is (0.05 quantile of t is 1.86 with df=7):

$$1.36 \pm \frac{0.32 \times 1.86}{\sqrt{9}} = (1.162, 1.558)$$

Quantile for t distribution is 2.101, so the confidence interval is:

$$\hat{X}_A - \hat{X}_B \pm 0.28 \times 2.101 = (-0.33, 0.85)$$
\[ s^2 = 292.5 \]
\[ df = 8 \]
\[ t \text{ quantile} = 2.306 \]

Confidence interval
\[ \hat{Y}_A - \hat{Y}_B \pm 2.306 \times 12.09 = (-24.28, 31.48) \]

Point zero is in the interval, so A is not necessarily better than B in 95% confidence.

\[ \hat{Y}_B = 0.22 \]
\[ \sigma_B = 0.41 \]
\[ \hat{Y}_A = 1.36 \]
\[ \sigma_A = 0.88 \]
\[ \hat{Y}_B - \hat{Y}_A = -1.14 \]
\[ s^2 = 0.50 \]
\[ s \sqrt{\frac{1}{n_A} + \frac{1}{n_B}} = 0.43 \]
\[ df = 9 \]

Quantile of confidence 95% t distribution is 2.262, and confidence 90% 1.833, both with degrees of freedom 9.

95% confidence for \( \eta_B - \eta_A \): \( -1.14 \pm 2.262 \times 0.43 = (-2.11, 0.17) \)

90% confidence for \( \eta_B - \eta_A \): \( -1.14 \pm 1.833 \times 0.43 = (-1.93, 0.35) \)