In a study of the lizard *Sceloporis occidentalis*, researchers examined field-caught lizards for infection by the malarial parasite *Plasmodium*. To help assess the ecological impact of malarial infection, researchers tested 15 infected and 15 uninfected lizards for stamina, measured by the distance (in meters) each animal could run in two minutes. Summary statistics are tabulated below. You may also use the fact that the estimated degrees of freedom of the sampling distribution of the test statistic is 27.2.

Group	$\bar{y}$	s	n
Infected lizards	26.87	6.81	15
Uninfected lizards	32.23	8.07	15

(a) Find a 90% confidence interval for the difference in population means.

Solution: $-5.36 \pm 1.703 \times 2.73$, or -5.36 ± 4.64.

(b) Interpret this confidence interval in the context of the problem.

Solution: We are 90% confident that the difference in stamina (as measured by the distance in meters run in two minutes) between the mean of all infected lizards and the mean in all uninfected lizards in the species *Sceloporis occidentalis* is between -10 and -0.72.

(c) The investigators wish to see if the population mean distance that infected lizards can run in two minutes (μ_1) is less than the population mean distance that uninfected lizards can run in two minutes (μ_2). State the null and alternative hypotheses for this test.

Solution:

$H_0 : \mu_1 = \mu_2$
$H_A : \mu_1 < \mu_2$

(d) Calculate the t test statistic.

Solution: $t = -5.36/2.7264 = -1.966$.

(e) Use the t-table to find bracketing values for the P-value (for example, $0.10 < p < 0.20$).

Solution: The p-value is the area to the left of -1.966 under a t distribution with 27.2 degrees of freedom, approximated here as 27 degrees of freedom. This area is between 0.025 and 0.05.

(f) Would the null hypothesis be rejected at significance level $\alpha = 0.10$?

Solution: Yes, the p-value is less than 0.10.