5.34

a. Reject H_0 if $t \leq -1.812$
b. Reject H_0 if $t \geq 2.086$
c. Reject H_0 if $t \leq 4.785$
d. Reject H_0 if $|t| > 3.055$

5.42

a. $H_0: \mu \leq 1600$ vs $H_a: \mu > 1600$

$$\text{p-value} = P\left(t \geq \frac{1718.3-1600}{137.8/\sqrt{18}}\right) = P(t \geq 3.64) \Rightarrow \text{p-value} \approx 0.001$$

Reject H_0 and conclude the data supports that the mean is greater than 1600 cubic feet.

b. $1718.3 \pm 2.110\dfrac{137.8}{\sqrt{18}} = 1718.3 \pm 68.53 = (1649.8, 1786.8)$; We are 95% confident that the mean volume of recycled paper for the population is between 1649.8 and 1786.8 cubic feet.

c. p-value $\approx$ 0.001. Yes, there is strong evidence that the mean volume is greater than 1600 cubic feet.

5.63

a. $H_0: \mu \geq 5.2$ versus $H_a: \mu < 5.2$

$n = 50, \bar{y} = 5.0, s = 0.70, \alpha = 0.05$

$$z = \frac{5.0-5.2}{0.7/\sqrt{50}} = -2.02$$

Reject H_0 if $z \leq -1.645$

b. Reject H_0 and conclude that the mean dissolved oxygen count is less than 5.2 ppm.

6.3 $H_0: \mu_1 \geq \mu_2 - 2.3$ versus $H_A: \mu_1 < \mu_2 - 2.3$
Reject if $t < -2.449$ (df = 32)

$$s_p = \sqrt{\frac{(13-1)7.23^2 + (21-1)6.98^2}{13+21-2}} = \sqrt{50.05} = 7.07$$

$$t = \frac{(50.3-58.6)-(-2.3)}{7.07\sqrt{\frac{1}{13}+\frac{1}{21}}} = -2.35 < -2.449 \Longrightarrow \text{fail to reject } H_0$$

The data DOES NOT provide significant evidence that μ_1 is less than $\mu_2 - 2.3$.

6.4

a. p-value = $P(t < -2.35) \approx 0.0126$

b. $(50.3 - 58.6) \pm 2.738 * 7.07\sqrt{\frac{1}{13}+\frac{1}{21}} = -8.3 \pm 6.83 = (-15.13, -1.47)$