1. $H_0: \mu = 19.551$
   $H_a: \mu > 19.551$

b) $H_0: \mu = 19.551$
   $H_a: \mu < 19.551$

c) $H_0: \mu = 19.551$
   $H_a: \mu \neq 19.551$

2. $n = 51$
   $\bar{x} = 30.2156863$
   $s = 6.3600275$

   $t = \frac{\bar{x} - \mu}{s/\sqrt{n}} = \frac{30.2156863 - 19.551}{6.3600275/\sqrt{51}}$
   $= 7.9038 > t_{table}(1.6)$

so, reject the $H_0$.

Evidence that winning S. B team score $> 19.551$ 97.8%

I am
b. \[ t = \frac{X - \mu}{SE} = \frac{-3.567423}{1.6} = -2.23 \\ -2.23 < -1.6 \]

Reject \( H_0 \). There is enough evidence that losing Superbowl team scored less than 10.551 pts.

C. \[ H_0 = 10.551 \]

\[ H_1 = 10.551 \]

[Diagram with the critical value and test statistic]

\[ \bar{x} = 23.1373 \]

\[ s = 10.9879 \]

\[ n = 102 \]

\[ t_{table} = -1.684 \]

\[ \frac{\bar{x} - \mu}{s/\sqrt{n}} = \frac{23.1373 - 10.551}{10.9879/\sqrt{102}} = 4.4 \]

[Diagram with the critical value and test statistic]