The FINA Junior World Diving Championships is an elite dive meet where top divers around the world aged 16 to 18 compete. In this worksheet, you will determine if there is a significant difference in the average total

score between divers aged 16, 17, and 18 using hypothesis tests.

**Individual Tests for Difference in Means:**

For the whole sample: n = 39, $\overbar{y}$ = 298.6615, and $s\_{y}$ = 48.95357

|  |  |  |  |
| --- | --- | --- | --- |
| **Age** | **Sample Size** | **Mean** | **Standard Deviation** |
| 16 | 7 | 268.25 | 34.2 |
| 17 | 18 | 305.59 | 38.8 |
| 18 | 14 | 304.96 | 62.4 |

Conduct a t-test for differences in means comparing the average total points for 16-year-old divers and

17-year-old divers. Include all parts of a hypothesis test, including hypotheses, t-statistic, and a conclusion.

$$H\_{0}: μ\_{16}= μ\_{17}$$

$$H\_{a}: μ\_{16}\ne μ\_{17}$$

**t-statistic:** $\frac{305.59-268.25}{\sqrt{\frac{(38.8)^{2}}{18}+ \frac{(34.2)^{2}}{7}}}=2.36$

**Degrees of Freedom:** 6

**p-value**: 0.028

**Conclusion**: Null hypothesis is rejected. The mean total points scored between 17 and 16 year-old divers is significantly different.

Conduct a t-test for differences in means comparing the average total points for 18-year-old divers and

17-year-old divers. Include all parts of a hypothesis test, including hypotheses, t-statistic, and a conclusion.

$$H\_{0}: μ\_{18}= μ\_{17}$$

$$H\_{a}: μ\_{18}\ne μ\_{17}$$

**t-statistic**: $\frac{305.59-304.96}{\sqrt{\frac{(38.8)^{2}}{18}+ \frac{(62.4)^{2}}{14}}}=0.03$

**Degrees of Freedom:** 13

**p-value**: 0.488

**Conclusion**: There is no significant difference between the total points scored between 17 and 18 year old divers.

Conduct a t-test for differences in means comparing the average total points for 16-year-old divers and

18-year-old divers. Include all parts of a hypothesis test, including hypotheses, t-statistic, and a conclusion.

$$H\_{0}: μ\_{16}= μ\_{18}$$

$$H\_{a}: μ\_{16}\ne μ\_{18}$$

**t-statistic**: $\frac{304.96- 268.25}{\sqrt{ \frac{(62.4)^{2}}{14}+ \frac{(34.2)^{2}}{7}}}=1.74$

**Degrees of Freedom:** 6

**p-value**: 0.066

**Conclusion**: There is no significant difference between the total points scored between 16- and 18-year-old divers.

Are there any differences in mean total points between different aged divers? If so, which one(s)?

Yes, 16 year-old divers mean total points are significantly different from 17 year-olds divers.