

Practice Worksheet: Confidence Interval for Mean

① $n=35$ $\bar{x}=82$ $s=15$ $df=34 \rightarrow 30$ $t_{.95}^*(30)=2.042$
 $t_{.99}^*(30)=2.750$

a) $\mu = \bar{x} = 82$

b) 95% conf int $82 \pm 2.042 \left(\frac{15}{\sqrt{35}} \right) = 82 \pm 5.177$
 $(76.823, 87.177)$

We are 95% confident the true population mean reading score for fifth grader is between 76.82 and 87.18.

c) 99% conf int $82 \pm 2.75 \left(\frac{15}{\sqrt{35}} \right) = 82 \pm 6.973$
 $(75.027, 88.973)$

We are ...

d) 99% conf int is wider; larger margin of error

② $n=35$ $\bar{x}=92$ $s=5$ $df=34 \rightarrow 30$ $t_{.95}^*(30)=2.042$

a) $\mu = \bar{x} = 92$

b) 95% conf int $92 \pm 2.042 \left(\frac{5}{\sqrt{35}} \right) = 92 \pm 1.726$
 $(90.274, 93.726)$

We are ...

↳ 95% conf int for $n=60$ $df=59$

$$92 \pm 2.009 \left(\frac{5}{\sqrt{60}} \right) = 92 \pm 1.318$$

$$t_{.95}^*(50) = 2.009 \quad (90.682, 93.318)$$

We are ...

③ $\bar{x} = 150,000$ $n=35$ $\mu = 150,000$ $df=34$ $t_{.95}^*(30) = 2.042$

$$150,000 \pm 2.042 \left(\frac{150,000}{\sqrt{35}} \right) = 150,000 \pm 5177.415$$

$$(144822.595, 155177.42)$$

We are ...

④ $\bar{x} = 43.45$ $\mu = 31.27$ $n=31$ $df=30$ $t_{.90}^* = 1.697$

$$43.45 \pm 1.697 \left(\frac{31.27}{\sqrt{31}} \right) = 43.45 \pm 9.531$$

$$(33.919, 52.981)$$

We are ...

⑤ $n=415$ $\bar{x} = 5000$ $\mu = 900$ $df=414$ $t_{.95}^* = 1.96$

$$5000 \pm 1.96 \left(\frac{900}{\sqrt{415}} \right) = 5000 \pm 87.652$$

$$(4912.348, 5087.652)$$

↓ approaches ∞ , really big sample size

* No, 4000 is NOT found in our interval

⑥ $n=50$ $\bar{x} = 3648$ $\mu = 630$ $df=49 \rightarrow 40$ $t_{.90}^* = 1.684$

$$3648 \pm 1.684 \left(\frac{630}{\sqrt{50}} \right) = 3648 \pm 150.037$$

$$(3497.96, 3798.04)$$

* \$3498 would keep tuition low.

⑦ always!!

⑧ $\bar{x} = 58.875$ $s = 5.08$ $n = 8$ $t^*_{.98} = 1.895$
 $df = 7$

$$58.875 \pm 1.895 \left(\frac{5.08}{\sqrt{8}} \right) = 58.875 \pm 3.404$$

(55.471, 62.279)

We are ...

⑨ $n = 28$ $\bar{x} = 14.3$ $s = 2$ $t^*_{.95} = 2.052$
 $df = 27$

$$14.3 \pm 2.052 \left(\frac{2}{\sqrt{28}} \right) = 14.3 \pm .7756$$

(13.52, 15.08)

$$\frac{15.08 \text{ miles}}{x} = \frac{30 \text{ miles}}{1}$$

approx $\frac{1}{2}$ hr

⑩ $n = 13$ $\bar{x} = 15$ $s = 1.7$ $t^*_{.95} = 3.055$
 $df = 12$

$$15 \pm 3.055 \left(\frac{1.7}{\sqrt{13}} \right) = 15 \pm 1.44$$

(13.56, 16.44)

16 mph