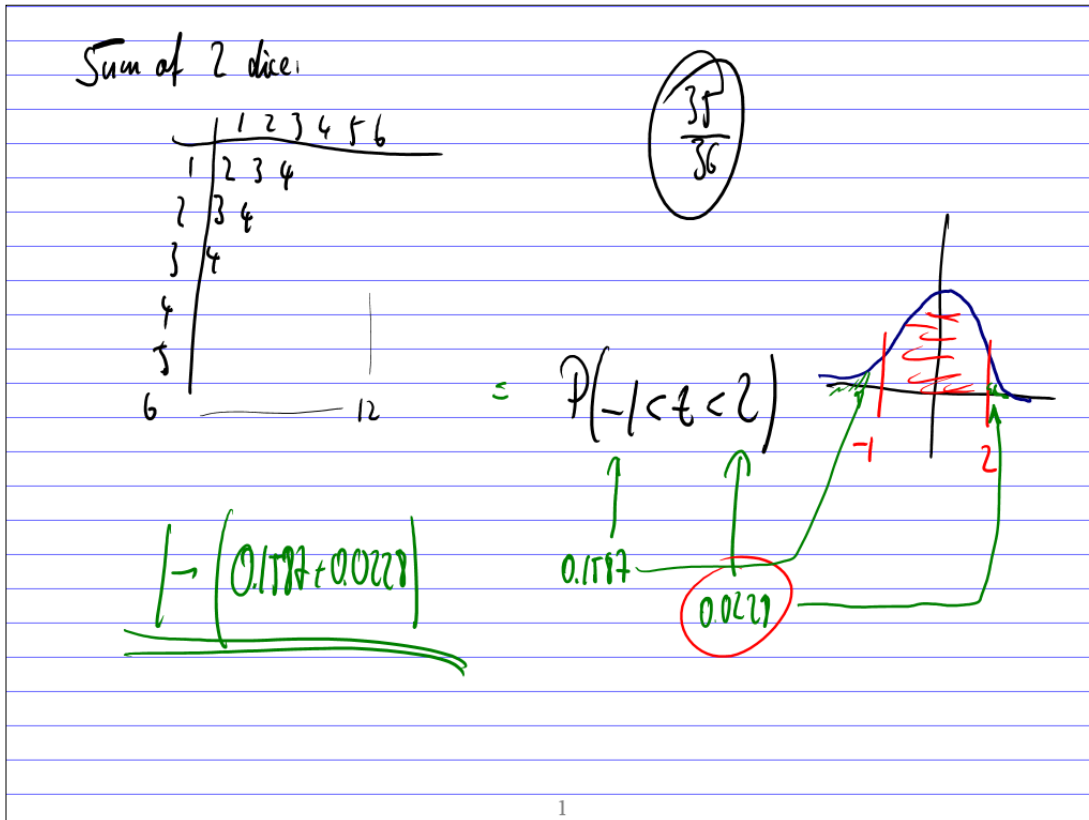
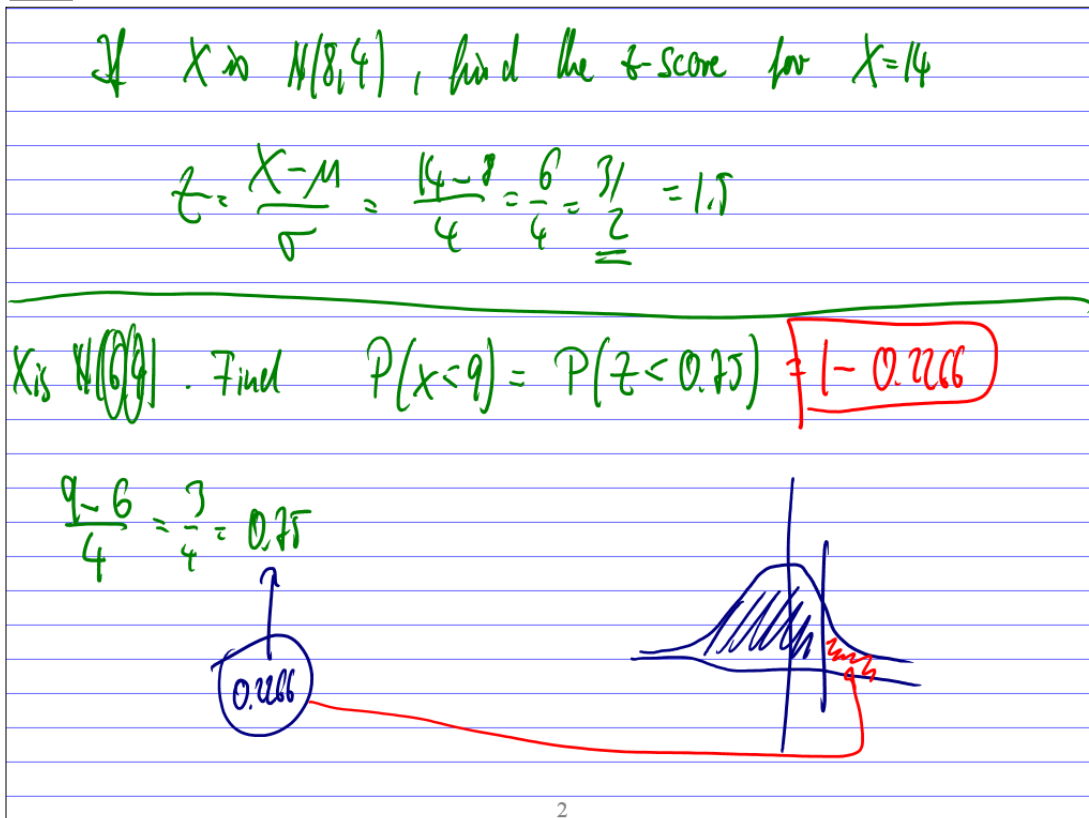


Panel 1



Panel 2



Panel 3

$$N(4, 1.5), P(3 < x < 5) = P(0.67 < z < 0.67) =$$

$$\frac{3-4}{1.5} = -\frac{1}{1.5} = -0.67 = -0.67$$

↓  
0.2514

$$\frac{5-4}{1.5} = \frac{1}{1.5} = 0.67$$

$$1 - 2 \cdot 0.2514$$



3

Panel 4

### Confidence Intervals about the Mean $\mu$

Want to use sample mean to estimate an unknown population mean.

① Find sample mean  $\bar{x}$  and std. dev.  $s$ , as well as sample size  $N$

② Compute standard error:  $\frac{s}{\sqrt{N}} = \frac{16}{\sqrt{100}} = \underline{1.6}$  with 90% certainty

③ Get multiplier. For 90% confidence interval, use 1.645

④ The true mean  $\mu$  is between  $\bar{x} - 1.645 \cdot \frac{s}{\sqrt{N}}$  and  $\bar{x} + 1.645 \cdot \frac{s}{\sqrt{N}}$

4

Panel 5

Ex: Lenovo Laptop Batteries last for      minutes.

Run 100 laptops until empty. Avg. time in, say 310 minutes, with  
std. dev. 16 minutes

$$\textcircled{2} \quad \frac{s}{\mu} = \frac{16}{310} = 1.6$$

$$\textcircled{3} \quad 1.645 \cdot 16 = 2.632$$

$\mu$  is between  $310 - 2.632$  and  $310 + 2.632$  with 90%  
certainty. 307.4 312.6

5

Panel 6

Other multipliers frequently used are:

$$90\% - \underline{1.645}$$

$$95\% - \underline{1.96}$$

$$99\% - \underline{2.58}$$

6

Panel 7

Worksheet #2

How many siblings do people have?

GSS:  $N = 2997$ ,  $\bar{x} = 3.86$ ,  $s = 3.52$ Want to be 99% sure. ② standard error  $\frac{s}{\sqrt{n}} = \frac{3.52}{\sqrt{2997}} = \underline{0.065}$ ③ Multiplier:  $2.58 \cdot 0.065 = \underline{0.17}$ ④ The population mean  $\mu = 3.86 \pm 0.17$  or  
from  $3.86 - 0.17$  to  $3.86 + 0.17$ ,3.69 to 4.0390% - interval would be narrower, like 3.80 to 3.92

Panel 8

Deluxe Model serves 109 mg. caffeine

Test 8 cups,  $\bar{x} = 110$  and  $s = 5.0$ Want to be 95% certain:  $\frac{s}{\sqrt{n}} = \frac{5.0}{\sqrt{64}} = \frac{5}{8} = 0.55$ multiplier  $1.96 \cdot 0.55 = \underline{1.079}$ From  $110 - 1.079$  to  $110 + 1.079 =$   
108.92 to 111.07So 109 mg is possible.Exam 2 on Wed!Review on Mon.