

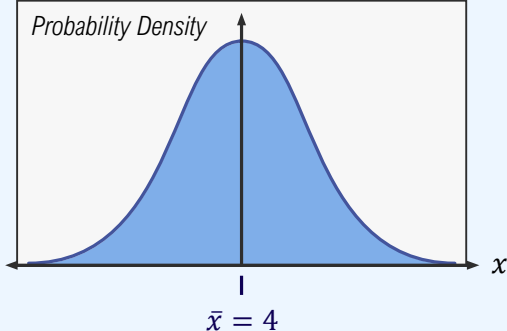
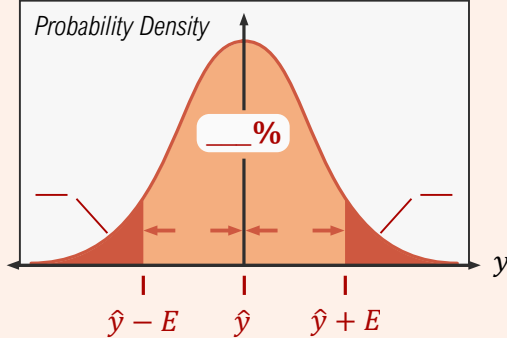
TOPIC: INTRODUCTION TO CONFIDENCE INTERVALS

Introduction to Confidence Intervals

- ◆ We can estimate parameters with a _____ **point estimate**, or a _____ of values, aka a **confidence interval**.
 - ▶ **Confidence Level**: _____ that the confidence interval contains the parameter. Notation: _____
 - ▶ **Margin of Error**: Distance between point estimate & _____ of interval.

EXAMPLE

(A) Find α for a 95% confidence interval. (B) Make a 95% confidence interval for a parameter, y , with point estimate $\hat{y} = 4$, & margin of error $E = 2$

Recall	Point Estimate	New	Confidence Interval
	Probability Density  $\bar{x} = 4$ Interpretation: μ_x is most likely 4	Probability Density  $\alpha = 1 - C$ $(\hat{y} - E < y < \hat{y} + E)$ Interpretation: We are _____ confident that y is between _____ & _____.	

- ◆ Other notation: (_____ , _____) or _____.

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PRACTICE

Find α for a 90% confidence interval.

PRACTICE

A market analyst is estimating the average monthly spending on online subscriptions among young adults. The point estimate $\hat{y}$ for the average monthly spending is \$45.60, with a margin of error E of \$3.20 at a 90% confidence level. Write and interpret a 90% Confidence Interval for the average monthly spending.

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PRACTICE

A company is interested in estimating lunch costs in their cafeteria, so they survey employees asking for their monthly lunch expenses. The staff calculated a 95% confidence interval for the mean amount of money spent on lunch to be (\$580, \$720). What are the point estimate and margin of error for this sample data?

TOPIC: INTRODUCTION TO CONFIDENCE INTERVALS

Critical Values: z-Scores

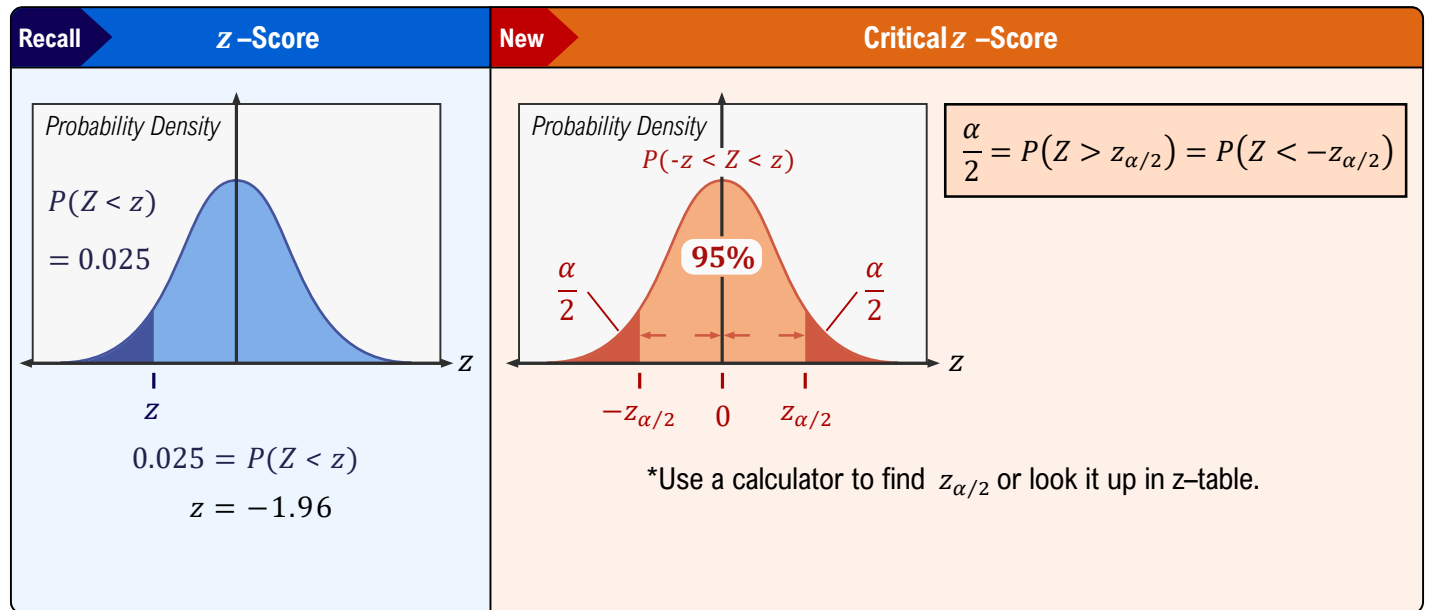
◆ To calculate margin of error, you'll often need a **critical value** $z_{\alpha/2}$, which is just a z-score.

► Recall: The TOTAL area in the two tails of a confidence interval is

Recall
 $\alpha = 1 - C$

EXAMPLE

Find the critical value, $z_{\alpha/2}$, for a 95% confidence interval.



◆ $z_{\alpha/2}$ will *always* be the same for a particular confidence level.

Confidence Level (C)	$\frac{\alpha}{2} = \frac{1 - \text{conf. lev.}}{2}$	$z_C = z_{\alpha/2}$
90%		
95%	$\frac{1 - 0.95}{2} = 0.025$	1.960
99%		

PRACTICE

Find the critical value, $z_{\alpha/2}$, for an 80% confidence interval.