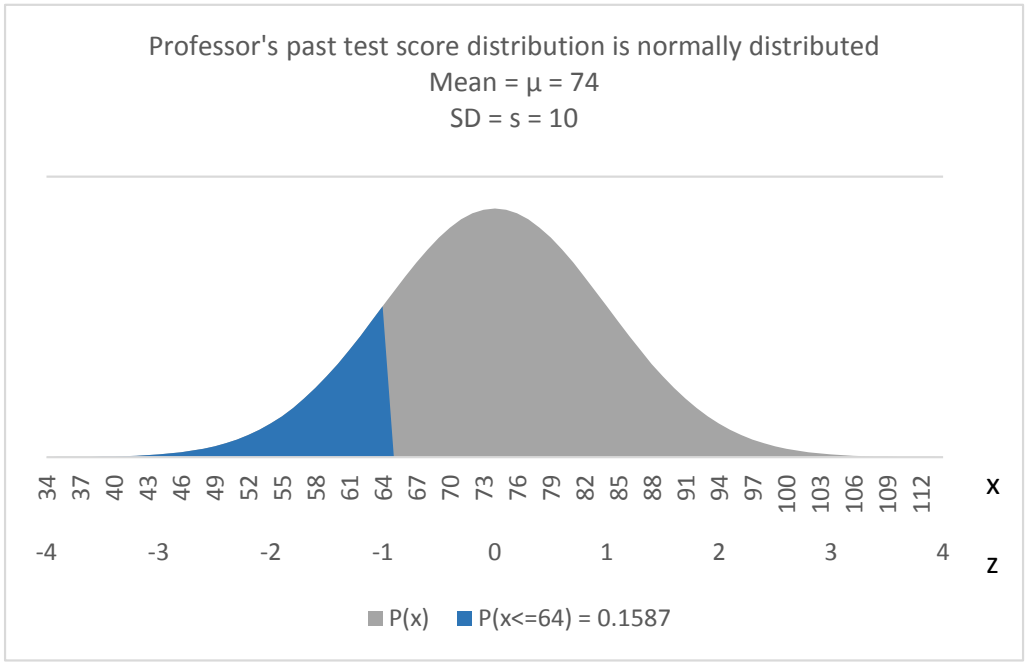
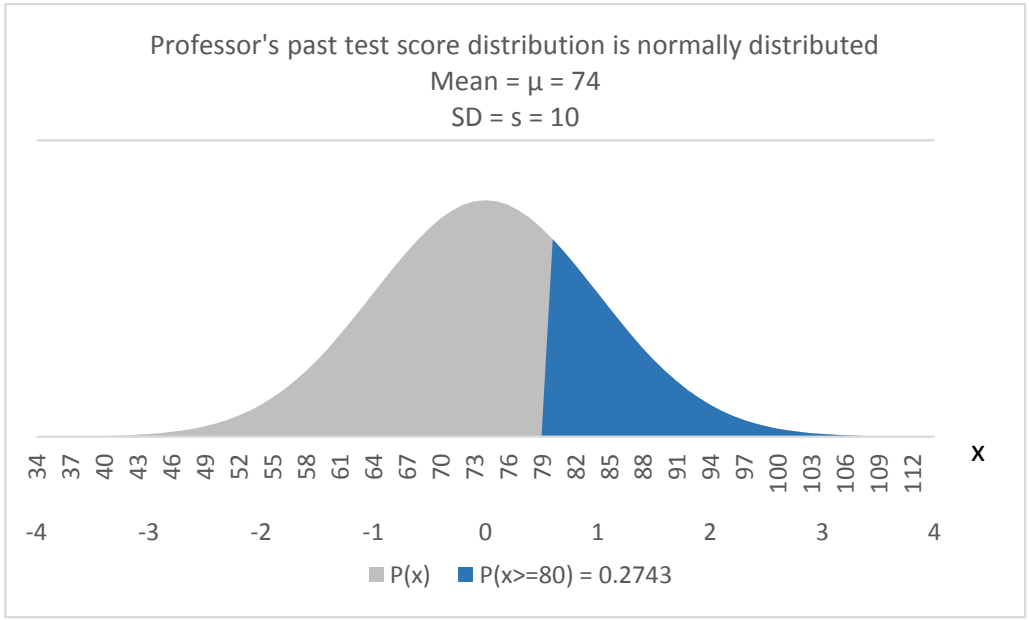
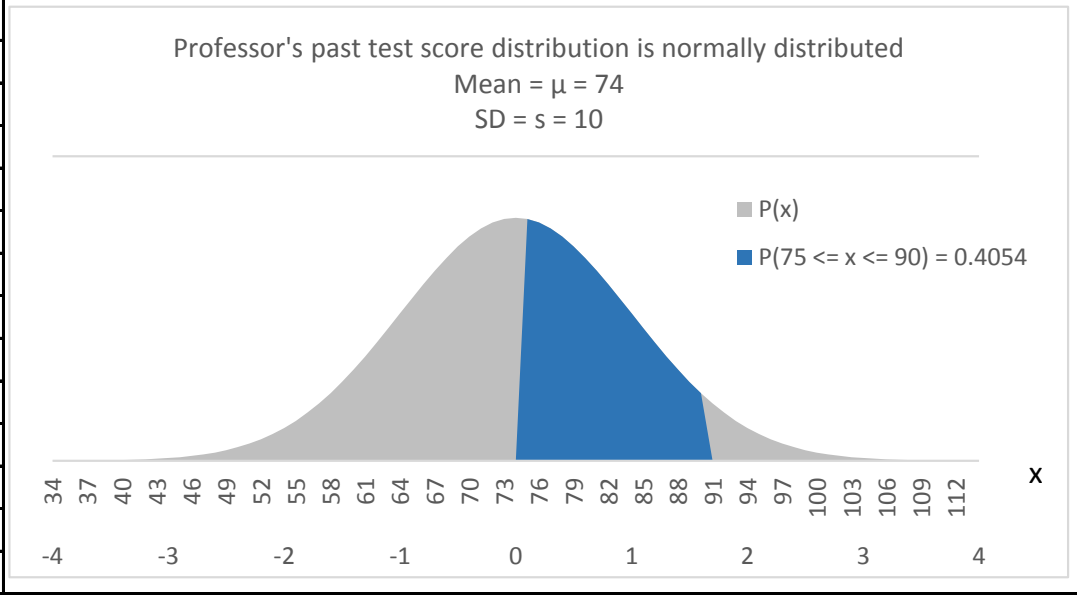
	A	B	C
1	**Professor's past test score distribution is normally distributed**		
2	Mean = μ	74	
3	SD = σ	10	
4	x	64	
5	Operator	<=	
6	P(x<=64)	0.158655254	=NORM.DIST(B4,B2,B3,1)
7	z	-1	=(B4-B2)/B3
8	P(z<=-1)	0.158655254	=NORM.S.DIST(B7,1)



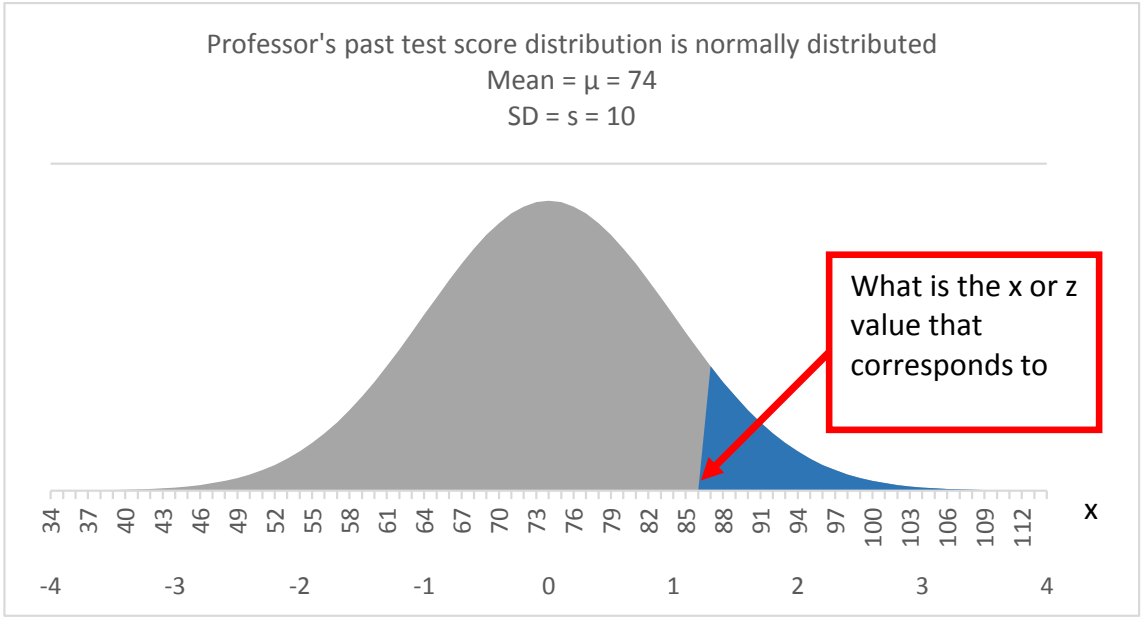
	A	B	C
1	**Professor's past test score distribution is normally distributed**		
2	Mean = μ	74	
3	SD = σ	10	
4	x	80	
5	Operator	>=	
6	P(x>=80)	0.274253118	=1-NORM.DIST(B4,B2,B3,1)
7	z	0.6	=(B4-B2)/B3
8	P(z>=0.6)	0.274253118	=1-NORM.S.DIST(B7,1)



	A	B	C	D	E	F
1	**Professor's past test score distribution is normally distributed**					
2	Mean = μ	74				
3	SD = σ	10				
4	**x lower**	75				
5	**x upper**	90				
6	**Operator**	between				
7	**P(75 <= x <= 90)**	0.405372871	=NORM.DIST(B5,B2,B3,1)-NORM.DIST(B4,B2,B3,1)			
8	**z lower**	0.1	=(B4-$B$2)/$B$3			
9	**z upper**	1.6	=(B5-$B$2)/$B$3			
10	**P(0.1 <= z <= 1.6)**	0.405372871	=NORM.S.DIST(B9,1)-NORM.S.DIST(B8,1)			



	A	B	C
1	**Professor's past test score distribution is normally distributed**		
2	Mean = μ	74	
3	SD = σ	10	
4	Probability	10%	
5	X value	86.81551566	=NORM.INV(1-B4,B2,B3)
6	z value	1.281551566	=NORM.S.INV(1-B4)



Professor's past test score distribution is normally distributed

Mean = μ	74	
SD = σ	10	
x	84	
Operator	<=	
P(x<=84)	0.841344746	=NORM.DIST(B4,B2,B3,1)
z	1	=(B4-B2)/B3
P(z<=1)	0.841344746	=NORM.S.DIST(B7,1)

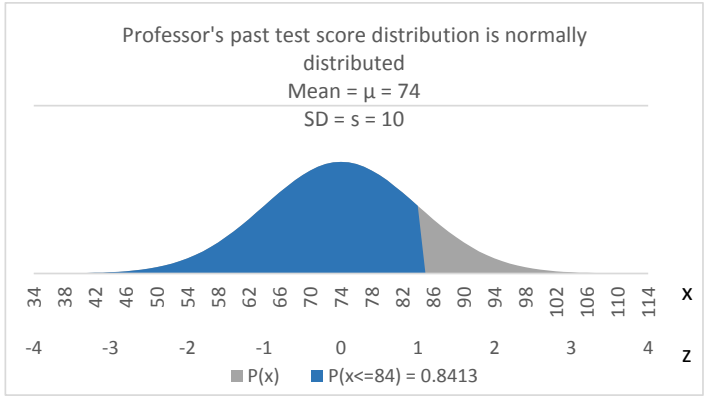


Chart Instructions:

1) Highlight P(x) column of chart heights and create area chart
2) Design Ribbon Tab, Select Data button, Add second column of P(x) with chart heights
3) Select second column of P(x) in chart, Ctrl + 1, Add to Secondary Axis
4) Design Ribbon Tab, Edit Series: For P(x<=x) add z values to Horizontal Axis,
For P(x) add x values to Horizontal Axis.
5) Click Plus Button, Axis, check Secondary Horizontal Axis
6) Select Top Axis, ctrl 1 to open Task Pane, then go to Series, then in Labels, Specify interval as 10
7) Still in Labels, select Label position Low
8) Above Labels in Tick Marks, Major and Minor: None
9) Adjust size of chart area to allow x-z text box
10) Insert Ribbon Tab, Text Box

x	P(x)	z	P(x<=84) = 0.8413
34	1.3383E-05	-4	1.3383E-05
35	1.98655E-05	-3.9	1.98655E-05
36	2.91947E-05	-3.8	2.91947E-05
37	4.2478E-05	-3.7	4.2478E-05

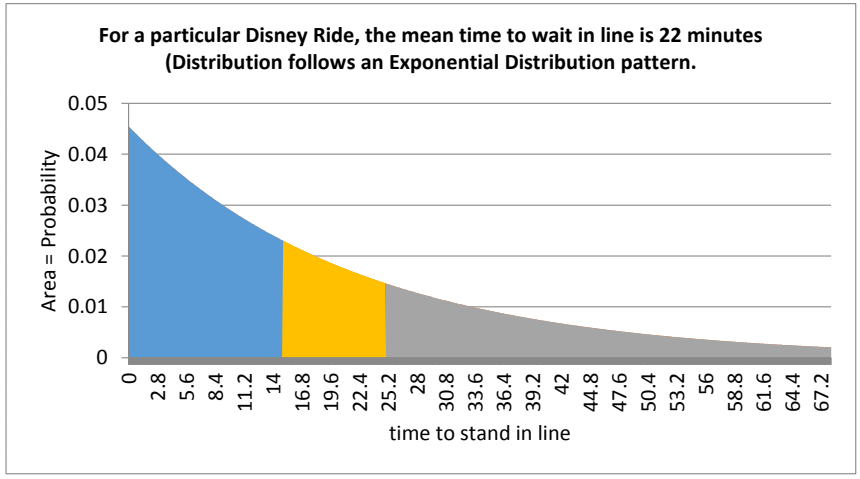
D22 = ="P("&A4&B5&B4&")"&" = "&ROUND(B6,4)
C23 = =NORM.DIST(A23,$B$2,$B$3,0)
D23 = =(A23-$B$2)/$B$3
E23 = =IF(A23<=$B$4,B23,"")

For a particular Disney Ride, the mean time to wait in line is 22 minutes (Distribution follows an Exponential Distribution pattern.

height of curve = $f(x) = \frac{1}{\mu} e^{-\frac{x}{\mu}}$

Mean = μ	22	time to stand in line		
x	15			
P(x<=15)	0.494303	.	=1-EXP(1)^(-B3/B2)	
P(x<=15)	0.494303		=EXPON.DIST(B3,1/B2,1)	
x	25			
P(x>=25)	0.320984	.	=EXP(1)^-(B6/B2)	
P(x>=25)	0.320984		=1-EXPON.DIST(B6,1/B2,1)	
P(15<=x<=25)	0.184713	.	=1-B8-B5	
P(15<=x<=25)	0.184713		=EXPON.DIST(B6,1/B2,1)-EXPONDIST(B3,1/B2,1)	

$P(x <= x_o) = 1 - e^{-\frac{x_o}{\mu}}$



Exponential Probability Distribution:

Useful for computing probabilities for the time it takes to complete a task
or the distance between similar occurrences (successes)
x = continuous random variable
Mean = Standard Deviation
Examples:
Time between arrivals at carwash
Time to take a test
Distance between potholes on a road
If the arrivals follow a **Poisson Distribution**, the time between arrivals must follow an **Exponential Distribution**.
Whereas the **Poisson Distribution** provides an appropriate description of the number of occurrences (successes) per interval
Exponential Distribution provides an appropriate description of the length of the interval between occurrences (successes)