

1) Find the area under the standard normal distribution curve to the left of  $z = 1.69$ .

Table:

1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	* .9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	↑ .9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706

On Calculators:

<pre>Normal C.D Data :Variable Lower :-1E+99 Upper :1.69 σ :1 μ :0 Save Res:None None LIST CASIO 9750</pre>	<pre>Normal C.D P =0.95448602 z:Low=-1E+99 z:Up =1.69</pre>	<pre>normalcdf lower:-1E99 upper:1.69 μ:0 σ:1 Paste TI84</pre>	<pre>normalcdf(-1E99,1.69,0,1) .....954486051</pre>
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Answer: 0.9545

2) Find the area under the standard normal curve to the left of  $z = 1.9$ .

1.7	.9554	.9564	.9573	.9582	.9591	↑ .9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857

On Calculators:

<pre>Normal C.D Data :Variable Lower :-1E+99 Upper :1.9 σ :1 μ :0 Save Res:None None LIST CASIO 9750</pre>	<pre>Normal C.D P =0.97128344 z:Low=-1E+99 z:Up =1.9</pre>	<pre>normalcdf lower:-1E99 upper:1.90 μ:0 σ:1 Paste TI84</pre>	<pre>normalcdf(-1E99,1.90,0,1) .....9712835072</pre>
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Answer: 0.9713

3) Find the area under the standard normal curve to the right of  $z = 2.7$

2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	* .9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	↑ .9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986

Since tables includes probabilities of less than a specific value –or area to the left of the value, in this case 2.70, and since the total area or probability es 1, the area or probability to the right of the value, that is, grater than the value es given by  $1 - 0.9965 = 0.0035$

Answer: 0.0035

**On Calculators:**

<pre>Normal C.D Data :Variable Lower :2.7 Upper :1E+99 σ :1 μ :0 Save Res:None None LIST CASIO 9750</pre>	<pre>Normal C.D P =3.467E-03 z:Low=2.7 z:Up =1E+99 This is 3.467 × 10<sup>-3</sup> = 0.003467</pre>	<pre>normalcdf lower:2.70 upper:1E99 μ:0 σ:1 Paste TI84</pre>	<pre>normalcdf(2.70,1E99,0,1) .....0034670231</pre>
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4) What is the area under the standard normal distribution curve between  $z = 1.50$  and  $z = 2.50$ ?

Area to the left of  $z = 2.50$  given by the table: 0.9938

2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949 *	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962 ↑	.9963	.9964

Area to the left of  $z = 1.50$  given by the table: 0.9332

1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495 *	.9505	.9515	.9525	.9535	.9545

The area, probability, between  $z = 1.50$  and  $z = 2.50$  is given by the difference of the areas:

$$0.9938 - 0.9332 = 0.0606$$

**Answer:** 0.0606

**On Calculators:**

<pre>Normal C.D Data :Variable Lower :1.5 Upper :2.5 σ :1 μ :0 Save Res:None None LIST CASIO 9750</pre>	<pre>Normal C.D P =0.06059753 z:Low=1.5 z:Up =2.5</pre>	<pre>normalcdf lower:1.50 upper:2.50 μ:0 σ:1 Paste TI84</pre>	<pre>normalcdf(1.50,2.50,0,1) .....0605975489</pre>
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5) The probability  $P(0 < z < 0.97)$  is 0.3340.

$P(z < 0.97) = 0.8340$  by the table:

TABLE A-2		(continued) Cumulative Area from the LEFT									
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359	
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753	
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141	
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517	
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879	
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224	
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549	
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852	
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133	
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389	
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621	

$P(z < 0) = 0.5000$  by the table:

**TABLE A-2** (continued) Cumulative Area from the LEFT

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141

The area or probability in between is given by:  $0.8340 - 0.5000 = 0.3340$

**Answer:** Yes, it is correct: the probability  $P(0 < z < 0.97)$  is 0.3340

**On Calculators:**

<pre>Normal C.D Data :Variable Lower :0 Upper :0.97 σ :1 μ :0 Save Res:None [None] LIST CASIO 9750</pre>	<pre>Normal C.D P =0.33397675 z:Low=0 z:UP =0.97</pre>	<pre>normalcdf lower:0.0 upper:0.97 μ:0 σ:1 Paste T184</pre>	<pre>normalcdf(0.0,0.97,0,1) .....3339767597</pre>
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6) Find the probability  $P(z > 0.78)$  using the standard normal distribution.

**TABLE A-2** (continued) Cumulative Area from the LEFT

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133

Table: cumulative area to the left of 0.78 is 0.7823

**Answer:** Since the total area (probability) is equal to 1, the area to the right is given by:  $1 - 0.7823 = 0.2177$

**On Calculators:**

<pre>Normal C.D Data :Variable Lower :0.78 Upper :1E+99 σ :1 μ :0 Save Res:None [None] LIST CASIO 9750</pre>	<pre>Normal C.D P =0.21769543 z:Low=0.78 z:UP =1E+99</pre>	<pre>normalcdf lower:0.78 upper:E99 μ:0 σ:1 Paste T184</pre>	<pre>normalcdf(0.78,E99,0,1) .....2176953687</pre>
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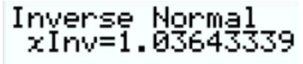
- 7) Find the z value to the right of the mean such that 85% of the total area under the standard normal distribution curve lies to the left of it?

85% as decimal, with four decimal places: 0.8500. Notice that in this question we are given the area or probability. Look up for 0.8500 inside the table. The answer is the z score that corresponds to an area of 0.8500


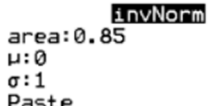
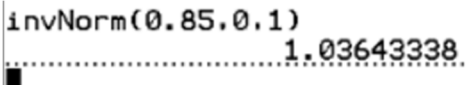
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830

The closest value to 0.8500 is 0.8508; the z score that corresponds to that area is 1.04

On calculators use the Inverse Normal function. On Casio, after selecting DIST => NORM:

	<p>Press F3 for InvN:</p> 	<p>Hit EXE:</p>  <p>which, to two decimal places = 1.04</p>
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On the TI84 select #3, invNorm:

	<p>Enter Area = 0.85</p> 	<p>Hit enter:</p> 
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