

## 6.2 Areas under the SNC

### GOALS:

1. Properties of the Stand Normal Curve (SNC)
2. Find areas under the SNC that correspond to specific z-scores.
3. Find z-scores corresponding to areas under the SNC.
4. Use Table for Areas under the SNC
5. Use calculator to find the areas under the SNC
6. Use calculator to find the z score for a given area under the SNC.

Study Ch. 6.2, # 51(47) - 59(55),  
63(59), 69(65), 73(69)-77(73), 81(77)

[Link to old Class Notes with problems using the z table.](#)

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## 6.2 Areas under the SNC

1. Properties of the Stand Normal Curve (SNC)

### Properties of the SNC:

1. Total Area under SNC = 1
2. x-axis is an asymptote of SNC
3. Symmetrical about  $\mu = 0$
4. Almost all area under SNC is within -3 and + 3 z scores (standard deviations)

### Area under the Normal Curve

(select menu(right top)/view/settings/4 decimal places)

$$y = \frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{2\pi}\sigma}$$

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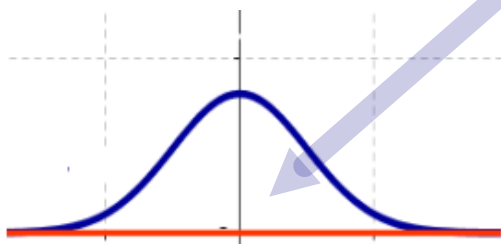
## 6.2 Areas under the SNC

2. Find areas under the SNC that correspond to specific z-scores.

Standard Normal Curve, to find **AREAS** use:

1. Calculator

2. Tables: see card in book, or appendix, or tables.pdf



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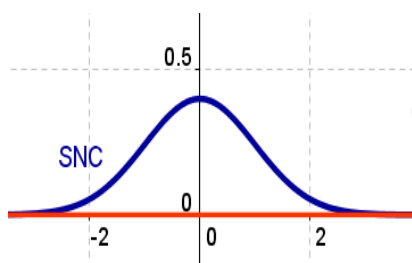
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## 6.2 Areas under the SNC



Total Area = 1

$0 \leq \text{area for interval under SNC} \leq 1$

$0 \leq p \leq 1$

Area for an Interval under SNC Relates to:

1. Relative frequency of Occurrence (Distribution Table)
2. Proportion of population in the interval
3. Probability that an individual selected at random is within the interval



SNC and area: powerful tool

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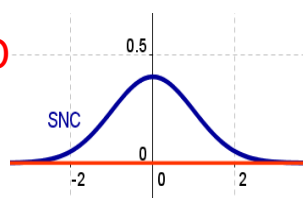
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## 6.2 Areas under the SNC

## Calculator Approach-REQUIRED

Find Area under the Normal Curve



2nd DISTR

**normalcdf(left, right, mean, standard deviation)**

Use this for any normal curve.

If using the Standard Normal Curve (SNC), the mean = 0 and the standard deviation = 1

eg: To find the area between  $z = -1$  and  $z = 1$  on the SNC, enter:**normalcdf(-1,1,0,1)** The result is **.6827**eg: To find the area between  $x = 60$  and  $x = 85$  for a normal distribution with mean=75 and stdev=10, enter:**normalcdf(60,85,75,10)** The result is **.7745**

To get areas in the left tail of the SNC, use -9 for the left bound.

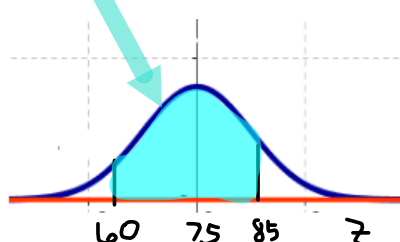
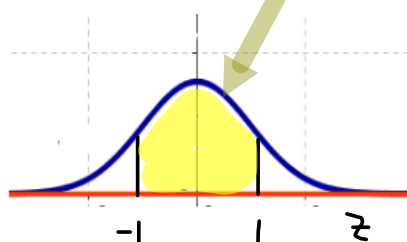
To get areas in the right tail of the SNC, use +9 for the right bound.

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## 6.2 Areas under the SNC

2. Find areas under the SNC that correspond to specific z-scores.

eg: To find the area between  $z = -1$  and  $z = 1$  on the SNC, enter:**normalcdf(-1,1,0,1)** The result is **.6827**eg: To find the area between  $x = 60$  and  $x = 85$  for a normal distribution with mean=75 and stdev=10, enter:**normalcdf(60,85,75,10)** The result is **.7745**

Using the calculator enables a solution w/o having to find the z-scores for 60 and 85

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## 6.1 Normal Distribution

cholesterol levels have:

**From 6.1**

$$G: \mu = 206 \text{ mg/dL} \quad \sigma = 44.7 \text{ mg/dL}$$

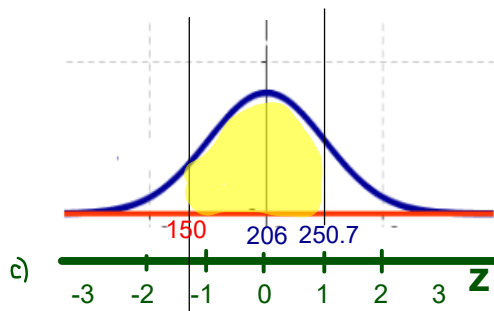
F: a) Sketch distribution of x. b) z c) Identify and sketch distribution of z.  
d) % with cholesterol level between

150 mg/dL and 250 mg/dL = area under SNC between  
 $z = -1.25$  and  $z = 0.98$

e) % with cholesterol level below 220 mg/dL  
= area under SNC that lies to \_\_\_\_\_ of \_\_\_\_\_

$$b) z = \frac{x - \mu}{\sigma} = \frac{206 - 250.7}{44.7}$$

$$z = \frac{x - 206}{44.7}$$



$$d) z = \frac{250 - 206}{44.7} = 0.98$$

$$z = \frac{150 - 206}{44.7} = -1.25$$

**Now, find area:**

$$\text{normalcdf}(150, 250, 206, 44.7) = 0.7324$$

don't even need z-scores

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## 6.1 Normal Distribution

cholesterol levels have:

**From 6.1**

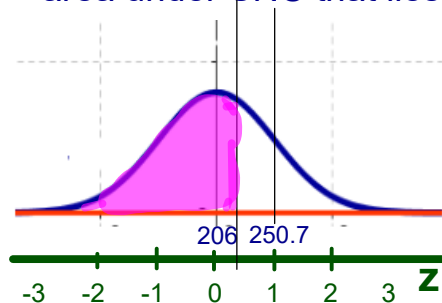
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150 mg/dL and 250 mg/dL = area under SNC between \_\_\_\_\_ and \_\_\_\_\_

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$$z = \frac{x - 206}{44.7}$$

$$d) z = \frac{250 - 206}{44.7} = 0.98$$

$$z = \frac{150 - 206}{44.7} = -1.25$$

$$e) \text{ left } z = \frac{220 - 206}{44.7} = 0.31$$

**Now, find area:**

$$\text{normalcdf}(0, 220, 206, 44.7) = 0.6229$$

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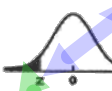
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Table Approach-classical NOT REQUIRED for this class



area to left of z score

Table Z: Areas under the standard normal curve (negative Z)

| Second decimal place in z |        |        |        |        |        |        |        |        |        | z    |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| 0.09                      | 0.08   | 0.07   | 0.06   | 0.05   | 0.04   | 0.03   | 0.02   | 0.01   | 0.00   |      |
| 0.0001                    | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0000 | -3.9 |
| 0.0001                    | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | -3.8 |
| 0.0001                    | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | -3.7 |
| 0.0001                    | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | -3.6 |
| 0.0002                    | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | 0.0002 | -3.5 |
| 0.0002                    | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | -3.4 |
| 0.0003                    | 0.0004 | 0.0004 | 0.0004 | 0.0004 | 0.0004 | 0.0004 | 0.0005 | 0.0005 | 0.0005 | -3.3 |
| 0.0005                    | 0.0005 | 0.0005 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0006 | 0.0007 | 0.0007 | -3.2 |
| 0.0007                    | 0.0007 | 0.0008 | 0.0008 | 0.0008 | 0.0008 | 0.0008 | 0.0009 | 0.0009 | 0.0009 | -3.1 |
| 0.0010                    | 0.0010 | 0.0011 | 0.0011 | 0.0011 | 0.0012 | 0.0012 | 0.0013 | 0.0013 | 0.0013 | -3.0 |
| 0.0014                    | 0.0014 | 0.0015 | 0.0015 | 0.0016 | 0.0016 | 0.0017 | 0.0018 | 0.0018 | 0.0019 | -2.9 |
| 0.0019                    | 0.0020 | 0.0021 | 0.0021 | 0.0022 | 0.0023 | 0.0023 | 0.0024 | 0.0025 | 0.0026 | -2.8 |
| 0.0026                    | 0.0027 | 0.0028 | 0.0029 | 0.0030 | 0.0031 | 0.0032 | 0.0033 | 0.0034 | 0.0035 | -2.7 |
| 0.0036                    | 0.0037 | 0.0038 | 0.0039 | 0.0040 | 0.0041 | 0.0043 | 0.0044 | 0.0045 | 0.0047 | -2.6 |
| 0.0048                    | 0.0049 | 0.0051 | 0.0052 | 0.0054 | 0.0055 | 0.0057 | 0.0059 | 0.0060 | 0.0062 | -2.5 |
| 0.0064                    | 0.0066 | 0.0068 | 0.0069 | 0.0071 | 0.0073 | 0.0075 | 0.0078 | 0.0080 | 0.0082 | -2.4 |
| 0.0084                    | 0.0087 | 0.0089 | 0.0091 | 0.0094 | 0.0096 | 0.0099 | 0.0102 | 0.0104 | 0.0107 | -2.3 |
| 0.0110                    | 0.0113 | 0.0116 | 0.0119 | 0.0122 | 0.0125 | 0.0129 | 0.0132 | 0.0136 | 0.0139 | -2.2 |
| 0.0143                    | 0.0146 | 0.0150 | 0.0154 | 0.0158 | 0.0162 | 0.0166 | 0.0170 | 0.0174 | 0.0179 | -2.1 |
| 0.0183                    | 0.0188 | 0.0192 | 0.0197 | 0.0202 | 0.0207 | 0.0212 | 0.0217 | 0.0222 | 0.0228 | -2.0 |
| 0.0233                    | 0.0239 | 0.0244 | 0.0250 | 0.0256 | 0.0262 | 0.0268 | 0.0274 | 0.0281 | 0.0287 | -1.9 |
| 0.0294                    | 0.0301 | 0.0307 | 0.0314 | 0.0322 | 0.0329 | 0.0336 | 0.0344 | 0.0351 | 0.0359 | -1.8 |
| 0.0367                    | 0.0375 | 0.0384 | 0.0392 | 0.0401 | 0.0409 | 0.0418 | 0.0427 | 0.0436 | 0.0446 | -1.7 |
| 0.0455                    | 0.0465 | 0.0475 | 0.0485 | 0.0495 | 0.0505 | 0.0516 | 0.0526 | 0.0537 | 0.0548 | -1.6 |
| 0.0559                    | 0.0571 | 0.0582 | 0.0594 | 0.0606 | 0.0618 | 0.0630 | 0.0643 | 0.0655 | 0.0668 | -1.5 |
| 0.0681                    | 0.0694 | 0.0708 | 0.0721 | 0.0735 | 0.0749 | 0.0764 | 0.0778 | 0.0793 | 0.0808 | -1.4 |
| 0.0823                    | 0.0838 | 0.0853 | 0.0869 | 0.0885 | 0.0901 | 0.0918 | 0.0934 | 0.0951 | 0.0968 | -1.3 |
| 0.0985                    | 0.1003 | 0.1020 | 0.1038 | 0.1056 | 0.1075 | 0.1093 | 0.1112 | 0.1131 | 0.1151 | -1.2 |
| 0.1170                    | 0.1190 | 0.1210 | 0.1230 | 0.1251 | 0.1271 | 0.1292 | 0.1314 | 0.1335 | 0.1357 | -1.1 |
| 0.1379                    | 0.1401 | 0.1423 | 0.1446 | 0.1469 | 0.1492 | 0.1515 | 0.1539 | 0.1562 | 0.1587 | -1.0 |
| 0.1611                    | 0.1635 | 0.1660 | 0.1685 | 0.1711 | 0.1736 | 0.1762 | 0.1788 | 0.1814 | 0.1841 | -0.9 |
| 0.1867                    | 0.1894 | 0.1922 | 0.1949 | 0.1977 | 0.2005 | 0.2033 | 0.2061 | 0.2090 | 0.2119 | -0.8 |
| 0.2148                    | 0.2177 | 0.2206 | 0.2236 | 0.2266 | 0.2296 | 0.2327 | 0.2358 | 0.2389 | 0.2420 | -0.7 |
| 0.2451                    | 0.2483 | 0.2514 | 0.2546 | 0.2578 | 0.2611 | 0.2643 | 0.2676 | 0.2709 | 0.2743 | -0.6 |
| 0.2776                    | 0.2810 | 0.2843 | 0.2877 | 0.2912 | 0.2946 | 0.2981 | 0.3015 | 0.3050 | 0.3085 | -0.5 |
| 0.3121                    | 0.3156 | 0.3192 | 0.3228 | 0.3264 | 0.3300 | 0.3336 | 0.3372 | 0.3409 | 0.3446 | -0.4 |
| 0.3483                    | 0.3520 | 0.3557 | 0.3594 | 0.3632 | 0.3669 | 0.3707 | 0.3745 | 0.3783 | 0.3821 | -0.3 |
| 0.3859                    | 0.3897 | 0.3936 | 0.3974 | 0.4013 | 0.4052 | 0.4090 | 0.4129 | 0.4168 | 0.4207 | -0.2 |
| 0.4247                    | 0.4286 | 0.4325 | 0.4364 | 0.4404 | 0.4443 | 0.4483 | 0.4522 | 0.4562 | 0.4602 | -0.1 |
| 0.4641                    | 0.4681 | 0.4721 | 0.4761 | 0.4801 | 0.4840 | 0.4880 | 0.4920 | 0.4960 | 0.5000 | -0.0 |

\* For values of z ≤ -3.90, the areas are 0.0000 to four decimal places

NOT REQUIRED for this class

area to left of z score

Table Z: Areas under the standard normal curve (positive Z)

| Second decimal place in z |        |        |        |        |        |        |        |        |        | z      |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 0.00                      | 0.01   | 0.02   | 0.03   | 0.04   | 0.05   | 0.06   | 0.07   | 0.08   | 0.09   |        |
| 0.0                       | 0.5000 | 0.5040 | 0.5080 | 0.5120 | 0.5160 | 0.5199 | 0.5239 | 0.5279 | 0.5319 | 0.5359 |
| 0.1                       | 0.5398 | 0.5438 | 0.5478 | 0.5517 | 0.5557 | 0.5596 | 0.5636 | 0.5675 | 0.5714 | 0.5753 |
| 0.2                       | 0.5793 | 0.5832 | 0.5871 | 0.5910 | 0.5948 | 0.5987 | 0.6026 | 0.6064 | 0.6103 | 0.6141 |
| 0.3                       | 0.6179 | 0.6217 | 0.6255 | 0.6293 | 0.6331 | 0.6368 | 0.6406 | 0.6443 | 0.6480 | 0.6517 |
| 0.4                       | 0.6554 | 0.6591 | 0.6628 | 0.6664 | 0.6700 | 0.6736 | 0.6772 | 0.6808 | 0.6844 | 0.6879 |
| 0.5                       | 0.6915 | 0.6950 | 0.6985 | 0.7019 | 0.7054 | 0.7088 | 0.7123 | 0.7157 | 0.7190 | 0.7224 |
| 0.6                       | 0.7257 | 0.7291 | 0.7324 | 0.7357 | 0.7389 | 0.7422 | 0.7454 | 0.7486 | 0.7517 | 0.7549 |
| 0.7                       | 0.7580 | 0.7611 | 0.7642 | 0.7673 | 0.7704 | 0.7734 | 0.7764 | 0.7794 | 0.7823 | 0.7852 |
| 0.8                       | 0.7881 | 0.7910 | 0.7939 | 0.7967 | 0.7995 | 0.8023 | 0.8051 | 0.8078 | 0.8106 | 0.8133 |
| 0.9                       | 0.8159 | 0.8186 | 0.8212 | 0.8238 | 0.8264 | 0.8289 | 0.8315 | 0.8340 | 0.8365 | 0.8389 |
| 1.0                       | 0.8413 | 0.8438 | 0.8461 | 0.8485 | 0.8508 | 0.8531 | 0.8554 | 0.8577 | 0.8599 | 0.8621 |
| 1.1                       | 0.8643 | 0.8665 | 0.8686 | 0.8708 | 0.8729 | 0.8749 | 0.8770 | 0.8790 | 0.8810 | 0.8830 |
| 1.2                       | 0.8849 | 0.8869 | 0.8888 | 0.8907 | 0.8925 | 0.8944 | 0.8962 | 0.8980 | 0.8997 | 0.9015 |
| 1.3                       | 0.9032 | 0.9049 | 0.9066 | 0.9082 | 0.9099 | 0.9115 | 0.9131 | 0.9147 | 0.9162 | 0.9177 |
| 1.4                       | 0.9192 | 0.9207 | 0.9222 | 0.9236 | 0.9251 | 0.9265 | 0.9279 | 0.9292 | 0.9306 | 0.9319 |
| 1.5                       | 0.9332 | 0.9345 | 0.9357 | 0.9370 | 0.9382 | 0.9394 | 0.9406 | 0.9418 | 0.9429 | 0.9441 |
| 1.6                       | 0.9452 | 0.9463 | 0.9474 | 0.9484 | 0.9495 | 0.9505 | 0.9515 | 0.9525 | 0.9535 | 0.9545 |
| 1.7                       | 0.9554 | 0.9564 | 0.9573 | 0.9582 | 0.9591 | 0.9599 | 0.9608 | 0.9616 | 0.9625 | 0.9633 |
| 1.8                       | 0.9641 | 0.9649 | 0.9656 | 0.9664 | 0.9671 | 0.9678 | 0.9686 | 0.9693 | 0.9699 | 0.9706 |
| 1.9                       | 0.9713 | 0.9719 | 0.9726 | 0.9732 | 0.9738 | 0.9744 | 0.9750 | 0.9756 | 0.9761 | 0.9767 |
| 2.0                       | 0.9772 | 0.9778 | 0.9783 | 0.9788 | 0.9793 | 0.9798 | 0.9803 | 0.9808 | 0.9812 | 0.9817 |
| 2.1                       | 0.9821 | 0.9826 | 0.9830 | 0.9834 | 0.9838 | 0.9842 | 0.9846 | 0.9850 | 0.9854 | 0.9857 |
| 2.2                       | 0.9861 | 0.9864 | 0.9868 | 0.9871 | 0.9875 | 0.9878 | 0.9881 | 0.9884 | 0.9887 | 0.9890 |
| 2.3                       | 0.9893 | 0.9896 | 0.9898 | 0.9901 | 0.9904 | 0.9906 | 0.9909 | 0.9911 | 0.9913 | 0.9916 |
| 2.4                       | 0.9918 | 0.9920 | 0.9922 | 0.9925 | 0.9927 | 0.9929 | 0.9931 | 0.9932 | 0.9934 | 0.9936 |
| 2.5                       | 0.9938 | 0.9940 | 0.9941 | 0.9943 | 0.9945 | 0.9946 | 0.9948 | 0.9949 | 0.9951 | 0.9952 |
| 2.6                       | 0.9953 | 0.9955 | 0.9956 | 0.9957 | 0.9959 | 0.9960 | 0.9961 | 0.9962 | 0.9963 | 0.9964 |
| 2.7                       | 0.9965 | 0.9966 | 0.9967 | 0.9968 | 0.9969 | 0.9970 | 0.9971 | 0.9972 | 0.9973 | 0.9974 |
| 2.8                       | 0.9974 | 0.9975 | 0.9976 | 0.9977 | 0.9977 | 0.9978 | 0.9979 | 0.9979 | 0.9980 | 0.9981 |
| 2.9                       | 0.9981 | 0.9982 | 0.9982 | 0.9983 | 0.9984 | 0.9984 | 0.9985 | 0.9985 | 0.9986 | 0.9986 |
| 3.0                       | 0.9987 | 0.9987 | 0.9987 | 0.9988 | 0.9988 | 0.9989 | 0.9989 | 0.9989 | 0.9990 | 0.9990 |
| 3.1                       | 0.9990 | 0.9991 | 0.9991 | 0.9991 | 0.9992 | 0.9992 | 0.9992 | 0.9992 | 0.9993 | 0.9993 |
| 3.2                       | 0.9993 | 0.9993 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9994 | 0.9995 | 0.9995 | 0.9995 |
| 3.3                       | 0.9995 | 0.9995 | 0.9995 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9996 | 0.9997 |
| 3.4                       | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9997 | 0.9998 |
| 3.5                       | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 | 0.9998 |
| 3.6                       | 0.9998 | 0.9998 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.7                       | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.8                       | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 | 0.9999 |
| 3.9                       | 1.0000 |        |        |        |        |        |        |        |        |        |

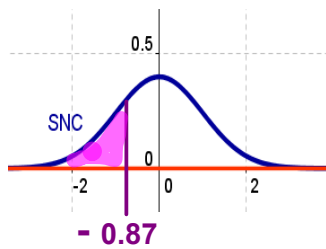
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## 6.2 Areas under the SNC

G: SNC F: area to left of:

a) - 0.87

b) 3.56 c) 5.12



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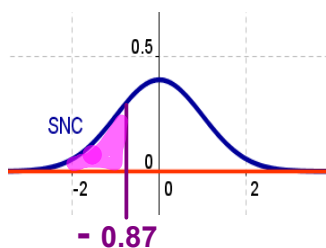
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a) - 0.87

b) 3.56 c) 5.12


 $\text{normalcdf}(\text{left}, \text{right}, \mu, \sigma) = \text{area betw left and right}$ 
 $\text{normalcdf}(-9, -0.87, 0, 1) = 0.19215 = 0.1922$ 

Use 4 decimal places for area: 0. \_ \_ \_ \_

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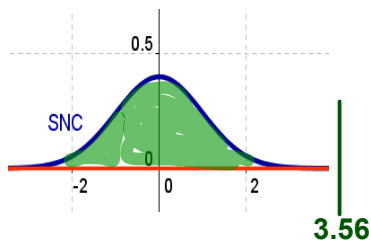
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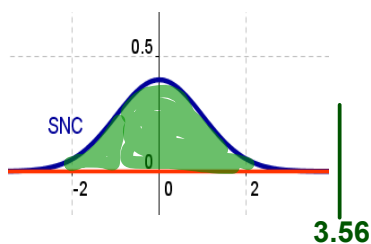
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 $\text{normalcdf}(\text{left}, \text{right}, \mu, \sigma) = \text{area betw left and right}$  $\text{normalcdf}(-9, 3.56, 0, 1) = 0.999814 = 0.9998$ 

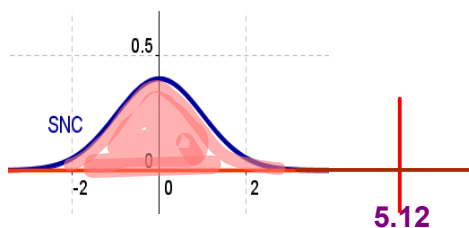
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## 6.2 Areas under the SNC

G: SNC F: area to left of:

a) - 0.87 b) 3.56 c) 5.12



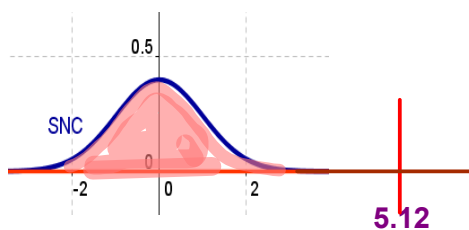
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## 6.2 Areas under the SNC

G: SNC F: area to left of:

a) - 0.87 b) 3.56 c) 5.12

 **$\text{normalcdf}(\text{left}, \text{right}, \mu, \sigma) = \text{area betw left and right}$**  **$\text{normalcdf}(-9, 5.12, 0, 1) = 0.9999998 = 1.0000$** 

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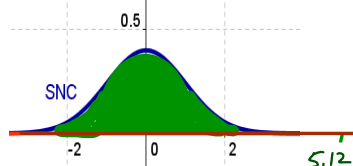
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## 6.2 Areas under the SNC

To find area using calculator:

1. ALWAYS draw a **sketch** that includes:  
normal curve  
an x value if appropriate,  
or a z score, and  
the area in question.
2. Use calculator to find the area. On your paper, write: *normalcdf(left, right, mean, std)*  
using the appropriate values



$$\text{normalcdf}(-9, 5.12, 0, 1) = 1.0000$$

area=1.0000  
to nearest 4 decimal places

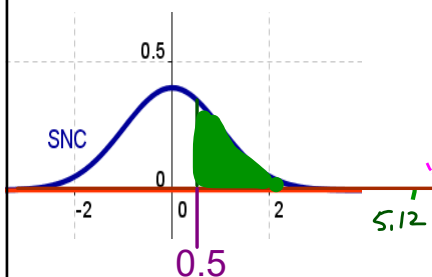
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## 6.2 Areas under the SNC

G: SNC F: area to **RIGHT** of  $z=0.5$

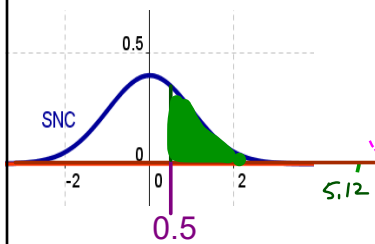


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## 6.2 Areas under the SNC

G: SNC F: area to **RIGHT** of  $z=0.5$ 

$$\text{normalcdf}(\text{left}, \text{right}, \mu, \sigma) = \text{area betw left and right}$$

$$\text{normalcdf}(0.5, 9, 0, 1) = 0.3085$$

Use 4 decimal places for area: 0. \_ \_ \_ \_

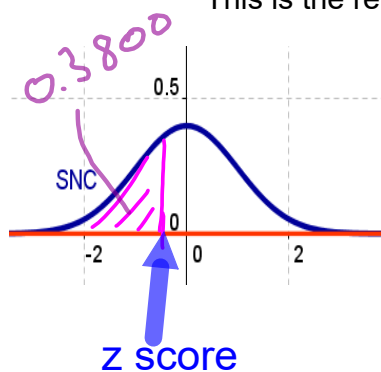
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## 6.2 Areas under the SNC

G: SNC F: **z score** with area to **left** = 0.3800

This is the reverse process of finding area, given z.

Use: 2nd Distr  
**invNorm**

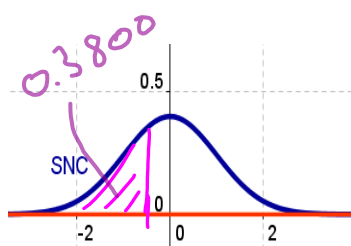
$$\text{invNorm}(\text{area to left}, \text{mean}, \text{stdev}) = \text{z score}$$

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## 6.2 Areas under the SNC

G: SNC F: z score with area to left=0.3800



$$z = -0.31$$

$$\text{invNorm}(\text{area to left}, \text{mean}, \text{stdev}) = \text{z score}$$

$$\text{invNorm}(0.38, 0, 1) = -0.3054 = -0.31$$

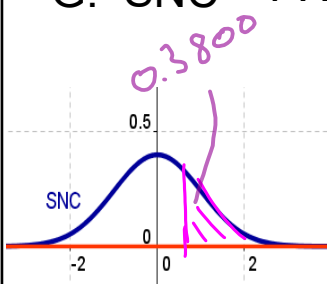
Use 2 decimal places for z-score:  $\pm \_ . \_ \_$ 

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## 6.2 Areas under the SNC

G: SNC F: z score with area to right=0.3800



$$\text{invNorm}(\text{area to left}, \text{mean}, \text{stdev}) = \text{z score}$$

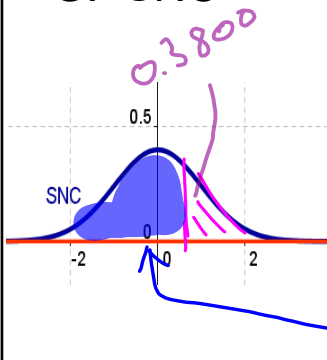
need area to left +  
G: area to right

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## 6.2 Areas under the SNC

G: SNC F: z score with area to right=0.3800



First need to find area to left:

$$\text{Area} = 1 - 0.3800 \\ = 0.6200$$

$$\text{invNorm}(\text{____}, 0, 1) = \text{__} . \text{__} = \text{__} . \text{__}$$

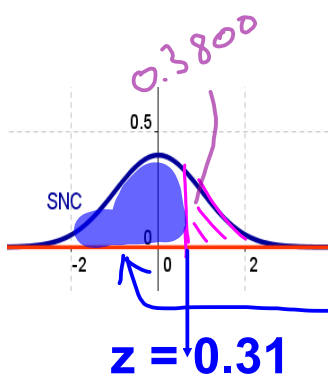
Use 2 decimal places for z-score:  $\pm \text{__} . \text{__}$ 

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## 6.2 Areas under the SNC

G: SNC F: z score with area to right=0.3800



$$\text{Area} = 1 - 0.3800 \\ = 0.6200$$

$$z = 0.31$$

$$\text{invNorm}(0.6200, 0, 1) = 0.3054 = 0.31$$

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## 6.1 Normal Distribution

cholesterol levels have:  
**From 6.1 and previous**

G:  $\mu = 206$  mg/dL  $\sigma = 44.7$  mg/dL

F: a) Sketch distribution of x. b) z c) Identify and sketch distribution of z.

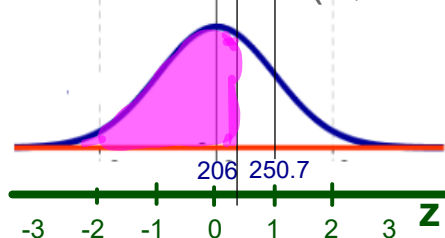
d) % with cholesterol level between

150 mg/dL and 250 mg/dL = area under SNC betw \_\_\_\_\_ and \_\_\_\_\_

e) % with cholesterol level below 220 mg/dL

= area under SNC that lies to \_\_\_\_\_

$\text{normalcdf}(0, 220, 206, 44.7) = 0.6229$



**Now, find x, cholesterol level at the 62.29%**

$\text{invNorm}(0.6229, 206, 44.7) = 219.996 = 220.0$

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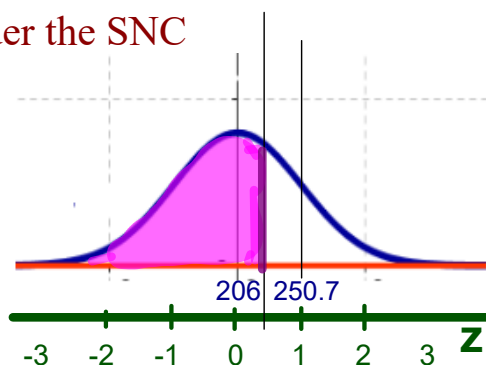
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## 6.2 Areas under the SNC



$\text{invNorm}(\text{area to left, mean, stdev}) = \text{boundary}$

$\text{invNorm}(\text{area to left, 0, 1}) = \text{z score}$

$\text{invNorm}(\text{area to left, mean, stdev}) = \text{x value}$

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