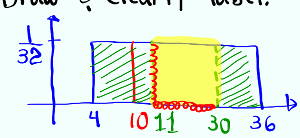
Statistics

Lecture 34

Feb 19-8:47 AM

Consider a uniform Prob. dist. for all values from 4 to 36

1) Draw & clearly label.



Total Prob ↔ Total Area

2) $P(x=10)$

$= \boxed{0}$

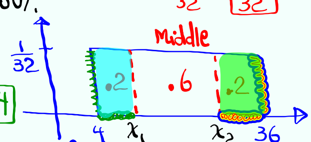
3) $P(x<11 \text{ or } x>30)$

$= 1 - P(11<x<30)$

$= 1 - (30-11)\cdot\frac{1}{32}$

$= 1 - \frac{19}{32} = \boxed{\frac{13}{32}}$

4) Find two values that separate the middle 60% from the rest.



$(x_1-4)\cdot\frac{1}{32} = .2$

$x_1 - 4 = 32(.2)$

$x_1 - 4 = 6.4$

$\boxed{x_1 = 10.4}$

$(36-x_2)\cdot\frac{1}{32} = .2$

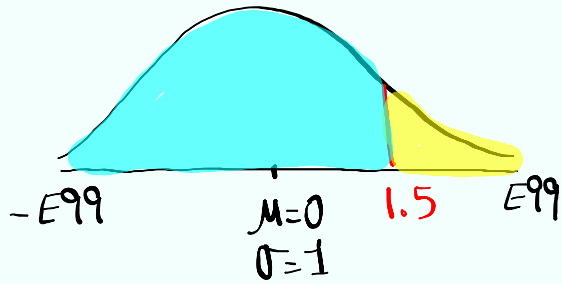
$36 - x_2 = 32(.2)$

$36 - x_2 = 6.4$

$\boxed{x_2 = 29.6}$

Oct 29-8:51 AM

find $P(Z = 1.5) = 0$



find $P(Z > 1.5)$ = normalcdf(1.5, E99, 0, 1) = .067

find $P(Z < 1.5)$ = normalcdf(-E99, 1.5, 0, 1) = .933

(-) 2nd ,

Total = 1

Oct 29-9:02 AM

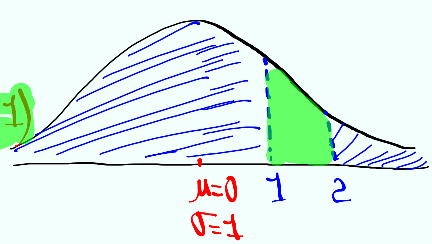
find $P(Z < 1 \text{ and } Z > 2) = 0$

find $P(Z < 1 \text{ OR } Z > 2)$

$= 1 - P(1 < Z < 2)$

1 - normalcdf(1, 2, 0, 1)

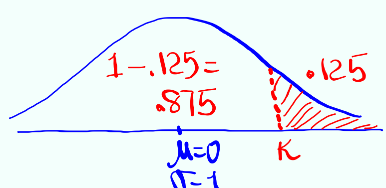
= .864



Find K such that

$P(Z > K) = .125$

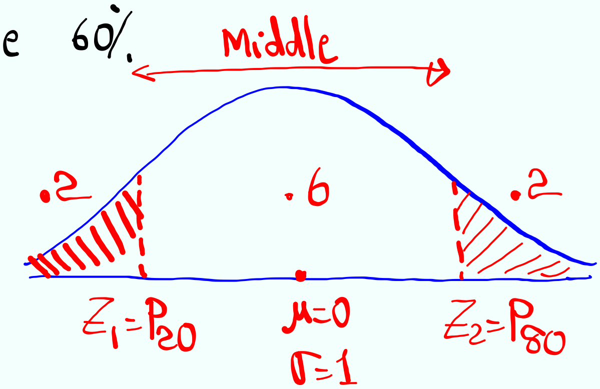
Right Area



K = invNorm(.875, 0, 1) = 1.150

Oct 29-9:08 AM

Find two Z-values that separate the middle 60% from the rest.



$Z_1 = \text{invNorm}(.2, 0, 1)$

$\approx \boxed{-.842}$

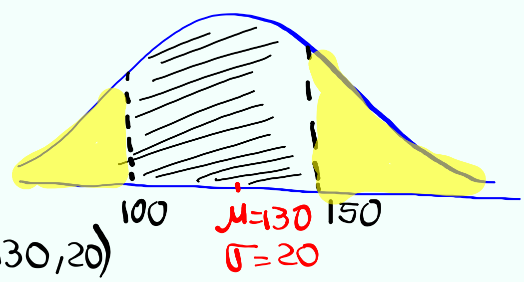
$Z_2 = \text{invNorm}(.8, 0, 1)$

$\approx \boxed{.842}$

Oct 29-9:16 AM

Given $N(130, 20)$

Normal Prob. dist — $\mu = 130$ — $\sigma = 20$



1) $P(100 < x < 150)$

$= \text{normalcdf}(100, 150, 130, 20)$

$= \boxed{.775}$

2) $P(x < 100 \text{ OR } x > 150) = 1 - .775 = \boxed{.225}$

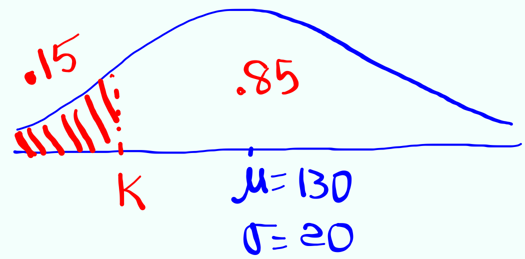
Oct 29-9:22 AM

3) find K such that $P(x < K) = .15$. Round to whole #.

Left Area

$K = \text{invNorm}(.15, 130, 20)$

$\approx$ **109**



Oct 29-9:30 AM

Exam Scores are normally dist. with $\mu = 85$ & $\sigma = 7.5$.

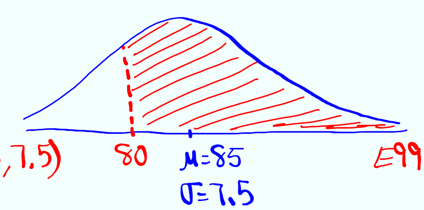
If one exam is randomly selected, find the prob. that score (x) is

a) above 80

$P(x > 80)$

$= \text{normalcdf}(80, E99, 85, 7.5)$

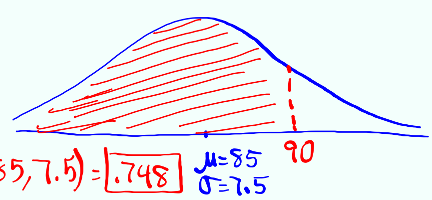
$\approx$ **.748**



b) below 90

$P(x < 90) =$

$\text{normalcdf}(-E99, 90, 85, 7.5) =$ **.748**



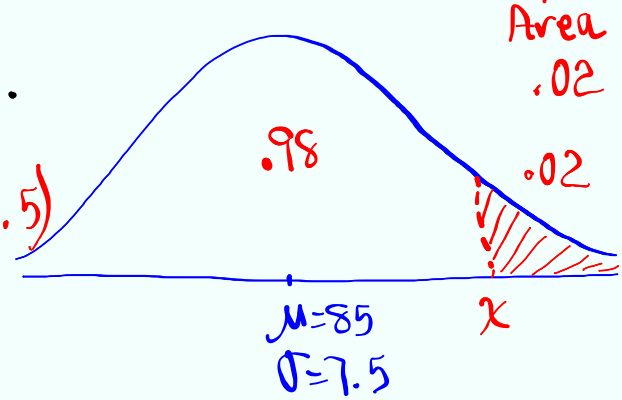
Oct 29-9:35 AM

Find a test score that separates the top 2% from the rest.
Round to whole #.

Right Area .02

$x = \text{invNorm}(.98, 85, 7.5)$

$\approx$ **100**



Oct 29-9:43 AM

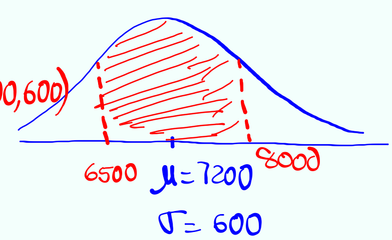
Salaries of nurses are normally dist with mean of \$7200/mo. and standard dev. of \$600/mo.
If one nurse is randomly selected, find the Prob. that his/her salary is between \$6500 and \$8000.

$P(6500 < x < 8000)$

$= \text{normalcdf}(6500, 8000, 7200, 600)$

$=$ **.787**

$\approx 79\%$

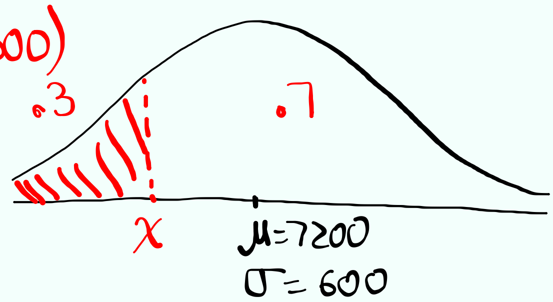


Oct 29-9:46 AM

Find a salary, rounded to whole #, that separates the bottom 30% from the rest.

$x = \text{invNorm}(.3, 7200, 600)$

$\approx \$6885$



Oct 29-9:54 AM