

Statistics

Lecture 10

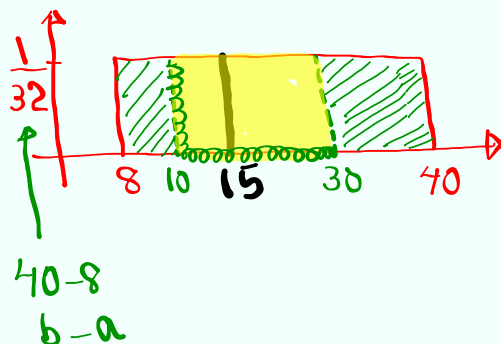


Feb 19-8:47 AM

Consider a uniform Prob. dist for all numbers from 8 to 40.

1) Draw and clearly label.

$$2) P(x=15) = 0$$



$$3) P(x < 10 \text{ or } x > 30)$$

$$= 1 - P(10 < x < 30)$$

$$= 1 - (30 - 10) \cdot \frac{1}{32}$$

$$= 1 - \frac{20}{32} = \frac{12}{32} = \boxed{\frac{3}{8}}$$

Nov 1-11:32 AM

4) Find two values that separate the middle 80% from the rest.

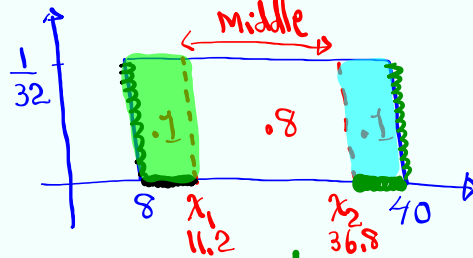
$$(x_1 - 8) \cdot \frac{1}{32} = .1$$

$$x_1 - 8 = 32(.1)$$

$$x_1 - 8 = 3.2$$

$$x_1 = 8 + 3.2$$

$$x_1 = 11.2$$



$$(40 - x_2) \cdot \frac{1}{32} = .1$$

$$40 - x_2 = 32(.1)$$

$$40 - x_2 = 3.2$$

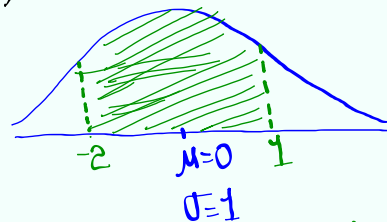
$$40 - 3.2 = x_2$$

$$x_2 = 36.8$$

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

Standard
Normal
Prob.
dist.



$$= \text{normalcdf}(-2, 1, 0, 1)$$

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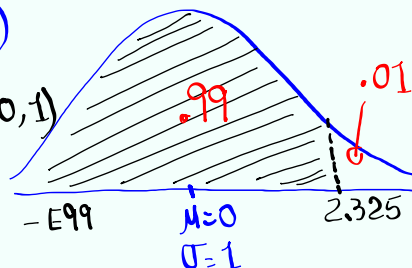
$$(-) = .819$$

Find $P(Z < 2.325)$

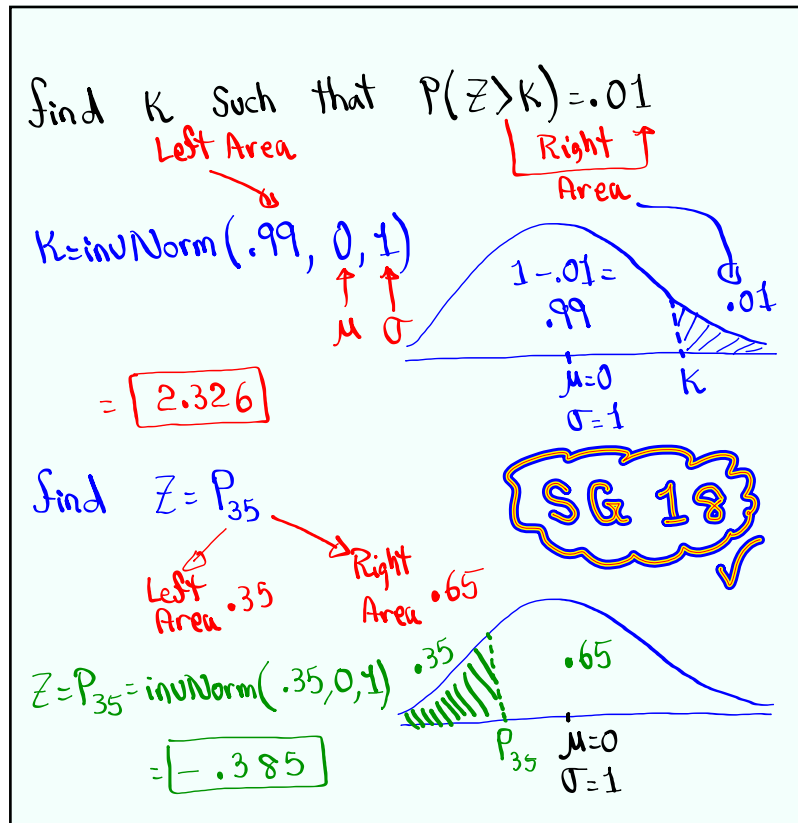
$$= \text{normalcdf}(-E99, 2.325, 0, 1)$$

$$(-) = .990$$

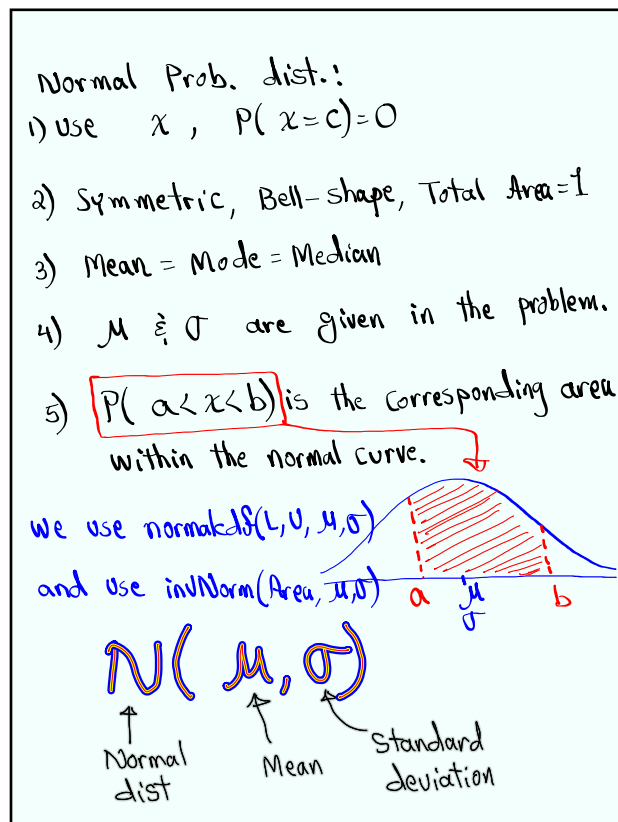
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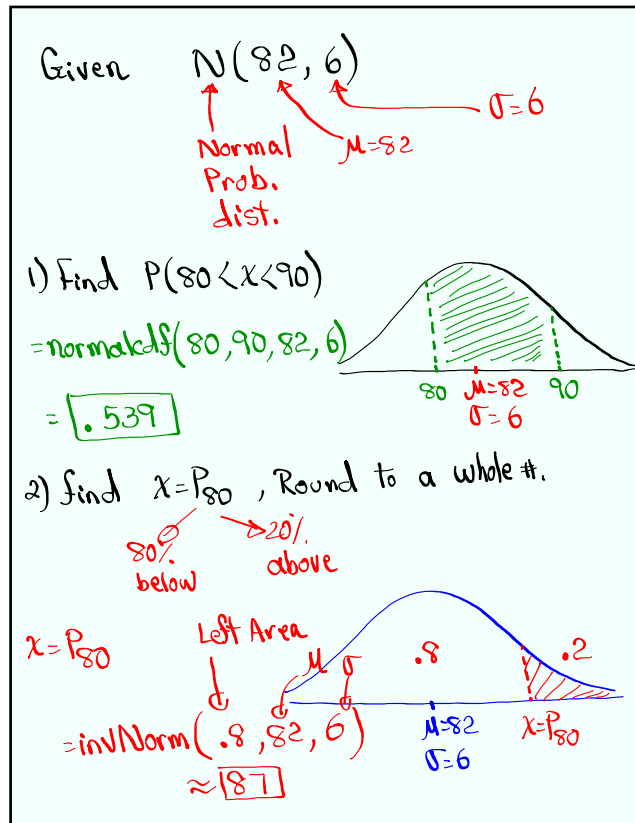
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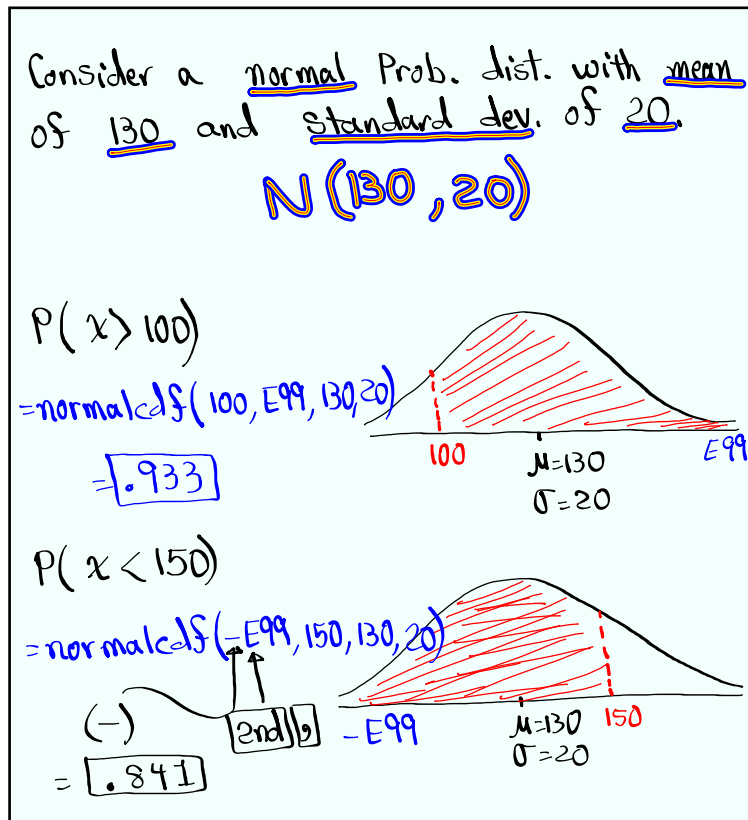
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Nov 1-12:04 PM



Nov 1-12:11 PM

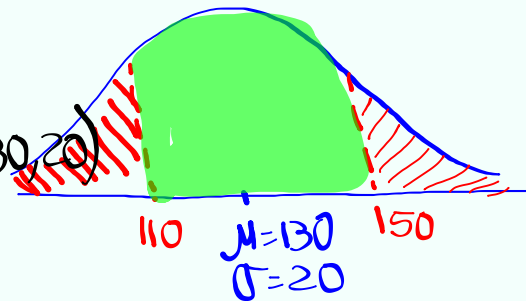
find $P(x < 110 \text{ and } x > 150) = 0$
 Impossible event

find $P(x < 110 \text{ OR } x > 150)$

$$= 1 - P(110 < x < 150)$$

$$= 1 - \text{normalcdf}(110, 150, 130, 20)$$

$$= \boxed{.317}$$

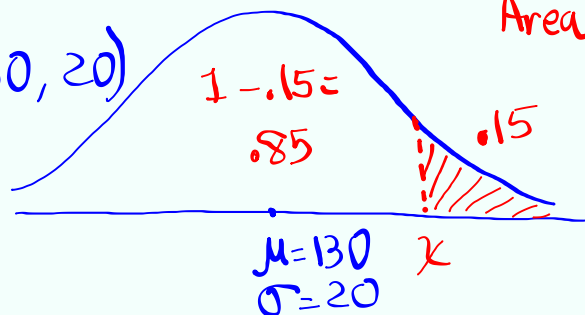


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find a value that separates the top 15% from the rest. Round to whole #.

$$x = \text{invNorm}(.85, 130, 20)$$

$$\approx \boxed{151}$$



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Ages of College students are normally distributed with the mean of 28.5 yrs and standard deviation of 4.2 yrs.

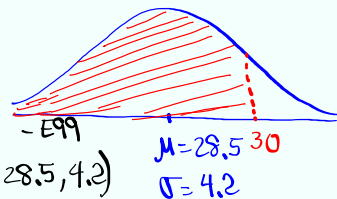
$$N(28.5, 4.2)$$

If we randomly select one student,
Find the prob. that his/her age is
1) below 30 yrs.

$$P(x < 30)$$

$$= \text{normalcdf}(-E99, 30, 28.5, 4.2)$$

$$= \boxed{.640}$$



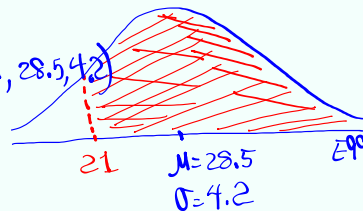
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2) above 21 yrs.

$$P(x > 21)$$

$$= \text{normalcdf}(21, E99, 28.5, 4.2)$$

$$= \boxed{.963}$$

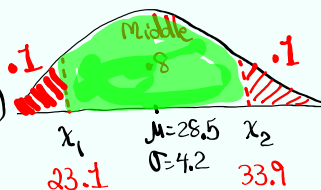


Find two ages, Round to 1-decimal, that separate the middle 80% from the rest.

$$x_1 = P_{10}$$

$$= \text{invNorm}(.1, 28.5, 4.2)$$

$$\approx \boxed{23.1}$$



$$x_2 = P_{90} = \text{invNorm}(.9, 28.5, 4.2)$$

$$\approx \boxed{33.9}$$

SG 193 ✓

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