Section 4.4: cont'd

Monday, February 19, 2018 8:26 AM

example: what is the probability that a normally distributed variable will have a value within

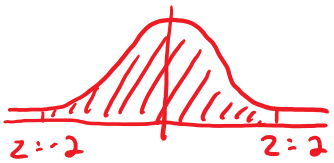
a) 1 standard deviation of the mean
b) 2 standard deviations of the mean

a)

area = 0.3413

$P(-1 < z < 1) = 2(0.3413)$
$= 0.6826$
$= 68\%$

b)



0.4772

$P(-2 < z < 2) = 2(0.4772)$
$= 0.9544$
$= 95\%$

Oh, look! It's the Empirical Rule!

note: Emp says ~95% if it's approximately normal-shaped

but it's 95.44% if it's exactly normal-shaped

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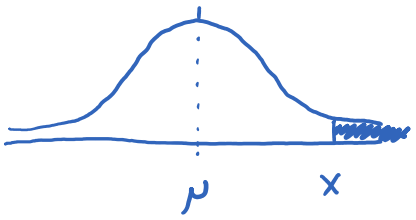
example: A grain loader can be set to discharge grain in amounts that are normally distributed with a standard deviation of

25.7 bushels. If a company wishes to use the loader to fill containers that hold 2000 bushels of grain and wants to overfill only one container in 100, at what mean value should the company set the loader?



want to find μ

$$z = \frac{x - \mu}{\sigma}$$

0.49 area = 0.01 (one in 100)

what's z for $p = 0.49$?

$z = 2.33$

$$z = \frac{x - \mu}{\sigma}$$

$$\mu = x - z\sigma$$

$$= 2000 - 2.33(25.7)$$
$$= 1940.12$$
$$= 1940 \text{ bushels}$$