

### Example

Class lengths are uniformly distributed between 50.0 and 52.0 minutes.

- Make a sketch of the pdf
- Randomly select a class length and find  $P(X < 51.5 \text{ min})$
- Randomly select a class length and find  $P(51.5 \text{ min} \leq X \leq 51.6 \text{ min})$
- Find  $\mu_X$  and  $\sigma_X$

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### Example

Assume that adults have IQ scores that are normally distributed with a mean of 100 and a SD of 15. For a randomly selected adult find:

- The probability that  $X < 130$
- The probability that  $90 < X < 110$
- $P_{10}$  and  $P_{60}$
- If  $P(X > x) = .0643$ , find  $x$
- If  $P(X < x) = .4500$ , find  $x$
- If  $P(X > x) = .9922$ , find  $x$

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### Example (from McClave and Sincich, 9<sup>th</sup> Ed., page 237)

A machine used to regulate the amount of dye dispensed for mixing shades of paint can be set so that it discharges an average of  $\mu$  milliliters (mL) of dye per can of paint. The amount of dye discharged is known to have a normal distribution with a standard deviation of 0.4 mL. If more than 6 mL of dye are discharged when making a certain shade of blue paint, the shade is unacceptable. Determine the setting for  $\mu$  so that only 1% of the cans of paint will be unacceptable.

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### Example (from McClave and Sincich, 9<sup>th</sup> Ed., page 223)

A tool and die machine shop produces extremely high-tolerance spindles. The spindles are 18-inch slender rods used in a variety of military equipment. A piece of equipment used in the manufacture of the spindles malfunctions on occasion and places a single gouge somewhere on the spindle. However, if the spindle can be cut so that it has 14 consecutive inches without a gouge, then the spindle can be salvaged for other purposes.

Assuming that the location of the gouge along the spindle is best described by a uniform distribution, what is the probability that a defective spindle can be salvaged?

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