

15 J #5  $X = \text{mass of the detergent}$

$$X \sim N(500, 20^2)$$

$$(a) P(X < 475) = P(Z < -1.25) = 0.106$$

$$Z = \frac{475 - 500}{20} = -1.25$$

$$(b) (0.106)(0.106)(0.106) = 0.00119$$

$P(A \cap B) = P(A) \cdot P(B)$  for independent events

15 M #5  $X = \text{child's height}$

$$X \sim N(136, \sigma^2)$$

$$Z = \frac{X - \mu}{\sigma}$$

$$P(X \geq 145) = \underline{0.12} \leftarrow \text{The } 88^{\text{th}} \text{ percentile}$$

$$Z = \text{invnorm}(0.88) = 1.175 = \frac{145 - 136}{\sigma}$$

$$\sigma = \frac{145 - 136}{1.175}$$

$$\boxed{\sigma = 7.66 \text{ cm}}$$

15M #7  $X = \text{cauliflower mass}$

$$X \sim N(0.85, \sigma^2)$$

$$P(X < 1.1) = 0.74$$

$$z = \text{invnorm}(0.74) = 0.6433 = \frac{1.1 - 0.85}{\sigma}$$

$$\sigma = \frac{1.1 - 0.85}{0.6433}$$

$$\boxed{\sigma = 0.389 \text{ kg}}$$

$$(b) P(X > 1) = P(Z > 0.386) = 0.350$$

$$Z = \frac{1 - 0.85}{0.389} = 0.386$$

P

ISM #10. Find  $\mu$  and  $\sigma$

$$P(X < 108) = 0.3 \leftarrow 30^{\text{th}} \text{ percentile}$$

$$z = -0.5244$$

$$P(X > 154) = 0.2 \leftarrow 80^{\text{th}} \text{ percentile}$$

$$z = 0.8416$$

$$\left\{ \begin{array}{l} -0.5244 = \frac{108 - \mu}{\sigma} \\ 0.8416 = \frac{154 - \mu}{\sigma} \end{array} \right.$$

(b)

$$z = \text{invnorm}(0.40)$$

$$z = -0.2533$$

$$-0.2533 = \frac{x - 126}{33.7}$$

$$\underline{x = 117}$$

subtr

$$\left\{ \begin{array}{l} -0.5244\sigma + \mu = 108 \\ 0.8416\sigma + \mu = 154 \end{array} \right.$$

$$-1.366\sigma = -46$$

$$\boxed{\sigma = 33.7}$$

$$0.8416(33.7) + \mu = 154$$

$$\boxed{\mu = 126}$$

10-3 Review

10-5 ⋮ Review

10-9 TEST

#2

X	1	2	3	4	5
$P(X=x)$	$5c$				

↑

$$P(X=1) = c \cdot 1(6-1)$$

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X	1	2	3
$P(X)$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$

$$E(X) = \sum x \cdot P(X=x)$$

$$E(X) = \frac{1}{2}(1) + \frac{1}{4}(2) + \frac{1}{4}(3) = 1.75$$

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①  $P(-1 < Z < 1) \approx 0.68$

$$P(-2 < Z < 2) = 0.95$$