

HW 15J # 1 - 3, 5 €
Euro

(#1) $X =$ amount spent/week

$$X \sim N(100, 20^2)$$

$\mu \uparrow$ \uparrow
 σ^2

$$(a) P(X < 130) = P(Z < 1.5) =$$

$$Z = \frac{130 - 100}{20} = 1.5$$

\uparrow

1.5 std. dev.
above the mean

$$(b) P(X > 90) = P(Z > -0.5) = \underline{\underline{0.691}}$$

$$Z = \frac{90 - 100}{20} = -0.5$$

$$(5) Z(80) = \frac{80 - 100}{20} = -1$$

$$Z(125) = \frac{125 - 100}{20} = 1.25$$

$$P(80 < X < 125)$$

$$= P(-1 < Z < 1.25) = \underline{\underline{0.736}}$$

(#2) $X =$ bolt diameter

$$X \sim \underline{\underline{N(4, 0.25^2)}}$$

$$P(\text{not a reject}) = P(3.5 < X < 4.5)$$

$$Z(3.5) = \frac{3.5 - 4}{0.25} = -2 \quad = 0.954$$

$$Z(4.5) = \frac{4.5 - 4}{0.25} = 2 \quad \boxed{(0.954)(500) = \underline{\underline{477}}}$$

$$P(\text{reject}) = 1 - 0.954 = 0.0455$$

Student's t -distribution

#5 $X =$ mass of a packet

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

$$N(500, 400)$$

$$P(X < 475) = P(Z < -1.25) = \underline{0.106}$$

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

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

HW quiz

Turnips average 10 oz in weight with $\sigma = 1.25 \text{ oz}$. Assume a normal distribution. $X =$ weight of a turnip

① $P(X > 12)$

② $P(9 < X < 11)$

Turnips have weights

$$X \sim N(10, 1.25^2)$$

Find the minimum weight of a turnip in the top 10% of weights.

$$\underline{z} = \text{invnorm}(0.90) = \underline{1.28}$$

↑
90th percentile

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

$$1.28 = \frac{x - 10}{1.25}$$

$$\underline{x = 11.60z}$$

15 L #4, 5
