

NAME: SOLUTIONS

QUIZ 6 (March 29, 2017)

Statistics for Social Science (201-401-DW)

Instructor: Emilie Richer

Instructions:

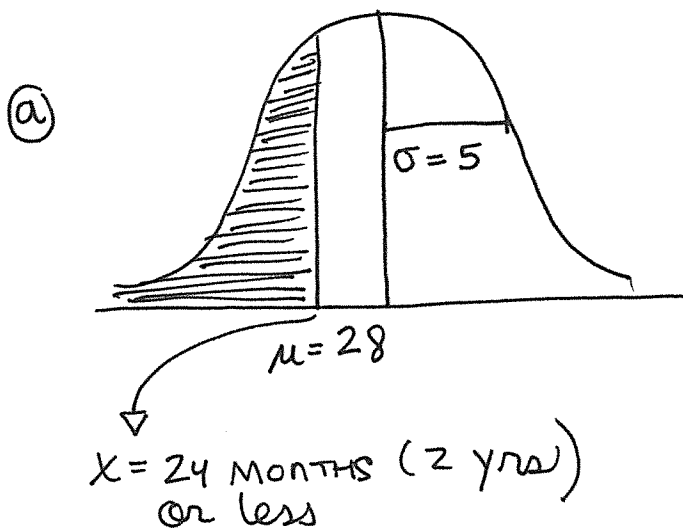
- You have **20 minutes** to complete the quiz
- No books, cell phones or other communication devices are permitted
- You must show all of your work in order to be credited with full marks
- Anyone suspected of cheating will be asked to leave
- This test is marked out of **5 marks**

[QUESTION 1] (5 MARKS)

Accrotime is a manufacturer of quartz crystal watches. Accrotime researchers have shown that the watches have an average life of 28 months before certain electronic components deteriorate, causing the watch to become unreliable. The standard deviation of watch lifetimes is 5 months, and the distribution of lifetimes is normal.

(a) If Accrotime guarantees a full refund on any defective watch for 2 years after purchase, what percentage of total production will the company expect to replace?

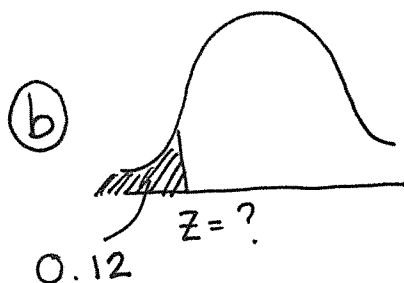
(b) If Accrotime does not want to make refunds on more than 12% of the watches it makes, how long should the guarantee period be (to the nearest month).



$$\begin{aligned} Z &= \frac{X - \mu}{\sigma} \\ &= \frac{24 - 28}{5} \\ &= -0.8 \end{aligned}$$

$$P(Z \leq -0.8) = \underline{0.2119}$$

21.19% OF WATCHES CAN BE EXPECTED TO HAVE TO BE REPLACED



$$Z = -1.17$$

$$-1.17 = \frac{X - 28}{5}$$

$$X = \underline{22.15}$$

THE GUARANTEE PERIOD SHOULD BE 22 MONTHS. Quiz 6 (201-401-DW) March 29, 2016