Math 153 - Quiz 7

April 10, 2014

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) A call center receives 1350 calls in a 30-day period.

   (a) What is the probability of the call center receiving more than 48 calls on any given day?

$\mu = \frac{1350}{30} = 45$. $P(x > 48) = 1 - P(x \leq 48)$

$= 1 - \text{poissoncdf}(45, 48)$

$\approx \boxed{0.2947}$

   (b) What is an unusually small number of daily calls?

$\mu = 45$

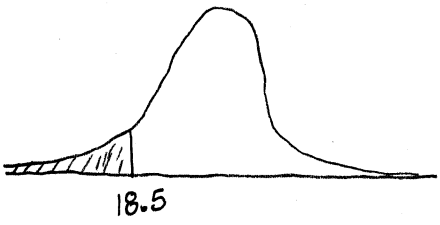
$\sigma = \sqrt{45}$

$\mu - 2\sigma = 45 - 2\sqrt{45} \approx 31.58$

31 or fewer daily calls are unusually small.

2. (3 points) A study found that the body mass index (BMI) of American young women is approximately normally distributed with mean 26.5 and standard deviation 6.4.

   (a) People with BMI less than 18.5 are classified as "underweight." What percent of young women are underweight by this criterion?

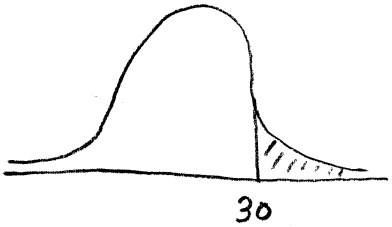


$P(x \leq 18.5)$

$= \text{normalcdf}(-99999, 18.5, 26.5, 6.4)$

$\approx \boxed{0.1056} = 10.56\%$

   (b) People with BMI greater than 30 are often classified as "obese." What percent of young women are obese by this criterion?

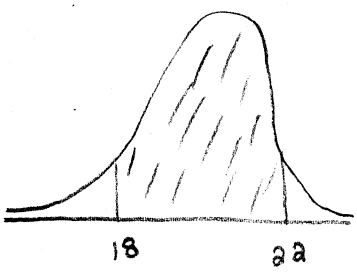


$P(x \geq 30) = \text{normalcdf}(30, 99999, 26.5, 6.4)$

$\approx \boxed{0.2922} = 29.22\%$

3. (4 points) Ignoring hybrids and electric cars, gas mileages are normally distributed with mean 20.3 mpg and standard deviation 4.3 mpg.

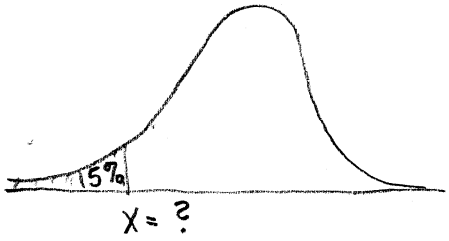
(a) About what percent of cars have gas mileages between 18 mpg and 22 mpg?



$P(18 \le x \le 22) = \text{normalcdf}(18, 22, 20.3, 4.3)$

$\approx \boxed{0.3573} = 35.73\%$

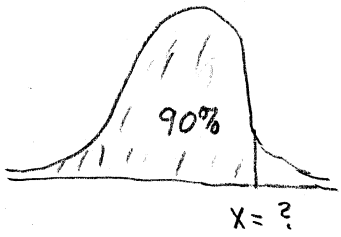
(b) What gas mileage is at the 15th percentile?



$\text{invNorm}(0.15, 20.3, 4.3)$

$\approx \boxed{15.84 \text{ mpg}}$

(c) What gas mileage is at the 90th percentile?



$\text{invNorm}(0.90, 20.3, 4.3)$

$\approx \boxed{25.81 \text{ mpg}}$