

Math 206 - Quiz 6

April 2, 2014

Name key

Score _____

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

1. (1 point) Julio scored 180 on a math test with mean 157.9 and standard deviation 27.3. Mary scored 43 on a physics test with mean 38.1 and standard deviation 6.2. Compute the corresponding z scores. Who scored better and why?

$$\text{Julio: } z = \frac{180 - 157.9}{27.3}$$

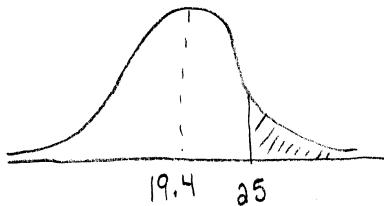
$$\approx 0.81$$

$$\text{Mary: } z = \frac{43 - 38.1}{6.2}$$

$$\approx 0.79$$

JULIO SCORED BETTER. HIS ORIGINAL SCORE IS 0.81 STANDARD DEVIATIONS ABOVE THE MEAN, MARY'S IS ONLY 0.79.

2. (2 points) The ages of Amtrak passenger train cars are normally distributed with mean 19.4 years and standard deviation 4.05 years. In a sample of 450 train cars, about how many are older than 25 years?



$$z = \frac{25 - 19.4}{4.05} \approx 1.38$$

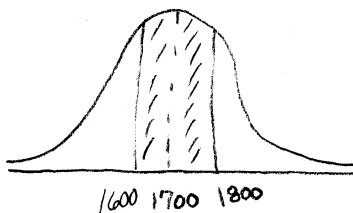
Look up $z = 1.38$ to get 0.4162

$$0.50 - 0.4162 = 0.0838$$

$$8.38\% \text{ of } 450$$

$$\approx 38 \text{ TRAIN CARS}$$

3. (2 points) A certain brand of light bulb has a mean lifetime of 1700 hr with a standard deviation of 150 hr. Assuming the lifetimes are normally distributed, about how many in an order of 5000 will have a lifetime of between 1600 hr and 1800 hr?



$$z_{1800} = \frac{1800 - 1700}{150} \approx 0.67$$

Look up $z = 0.67$ to get 0.2486

$$2 \times 0.2486 = 0.4972$$

$$49.72\% \text{ of } 5000$$

$$= 2486 \text{ BULBS}$$

$$z_{1600} \approx -0.67$$