

The average amount of student loan debt in 2016 was \$37,172, if this debt is said to be normally distributed with a standard deviation of \$7500, Use this information to answer the following questions:

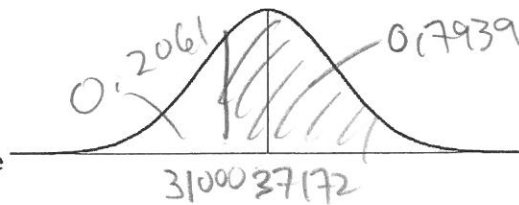
1. You randomly selected a person that has student loan debt, determine the probability that you selected a person that borrowed more than \$31000.

What is the associated Z score in this scenario? -0.82 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \geq 31000) = 0.7939$

What is the associated probability with this problem? 0.7939 or 79.39% $\frac{31000 - 37172}{7500}$

Sketch the scenario on the provided normal curve



2. You randomly selected a person that has student loan debt, determine the probability that you selected a person that borrowed either less than \$18000 OR more than \$29000.

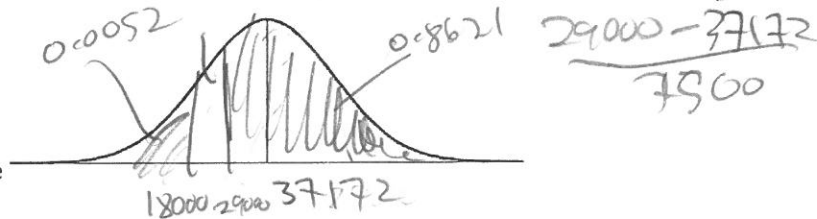
What are the associated Z scores in this scenario? -2.56 and -1.09 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \leq 18000) \text{ or } P(X \geq 29000) =$

What is the associated probability with this problem? 0.0052 + 0.8621 = 0.8673 or 86.73%

$$\frac{18000 - 37172}{7500} = -2.56$$

Sketch the scenario on the provided normal curve



3. You randomly selected a person that has student loan debt, determine the probability that you selected a person that borrowed between \$24500 and \$40500.

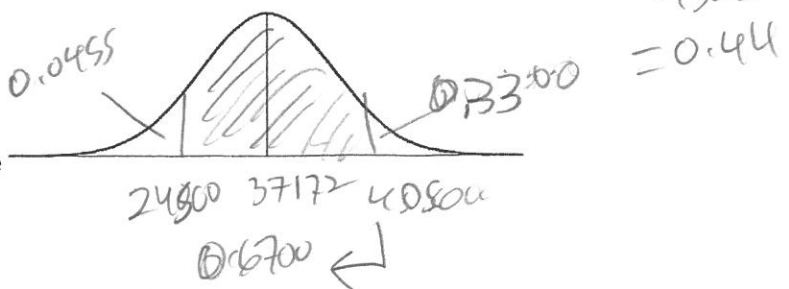
What are the associated Z scores in this scenario? -1.69 and 0.44 Round to TWO decimal places

What is the probability statement for this scenario? $P(24500 \leq X \leq 40500) = 0.6245$

What is the associated probability with this problem? 0.6245 or 62.45% $\frac{40500 - 37172}{7500} = 0.44$

$$\frac{24500 - 37172}{7500} = -1.69$$

Sketch the scenario on the provided normal curve



$$0.6700 - 0.0455 = 0.6245$$

$$1 - (0.0455 + 0.3300) = 1 - 0.3755 = 0.6245$$

The amount of money spent by families on Black Friday Shopping is said to be normally distributed at \$403 with a standard deviation of \$58

4. You randomly selected a family determine the probability that you selected a family that spent \$415 or less on Black Friday Shopping

What is the associated Z score in this scenario? 0.21 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \leq 415) = 0.5832$

What is the associated probability with this problem? 0.5832 or 58.32%



Sketch the scenario on the provided normal curve

5. You randomly selected a family determine the probability that you selected a family that spent either \$375 or less OR more than \$440 on Black Friday Shopping

What are the associated Z scores in this scenario? -0.48 and 0.64 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \leq 375) \text{ OR } P(X \geq 440) = 0.5767$

What is the associated probability with this problem? 0.3156 + 0.2611 = 0.5767 or 57.67%



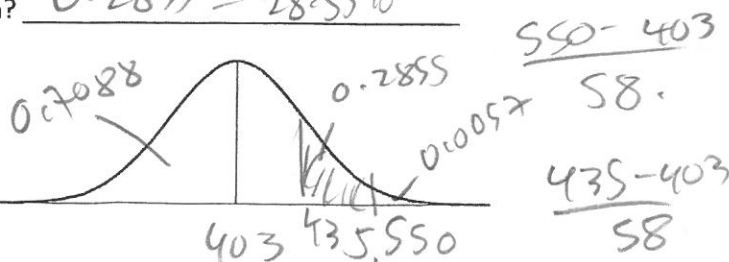
Sketch the scenario on the provided normal curve

6. You randomly selected a family determine the probability that you selected a family that spent between \$435 and \$550 on Black Friday Shopping

What are the associated Z scores in this scenario? 0.55 and 2.53 Round to TWO decimal places

What is the probability statement for this scenario? $P(435 \leq X \leq 550) = 0.2855$

What is the associated probability with this problem? 0.2855 = 28.55%



Sketch the scenario on the provided normal curve

$$0.9943 - 0.7088 = 0.2855$$

$$1 - (0.7088 + 0.0057)$$

$$1 - 0.7145 = 0.2855$$

The average amount of snowfall in December in Peoria is 7.1 inches. If the amount of snowfall in Peoria in December is said to be normally distributed and has a standard deviation of 1.75 inches then answer the following questions:

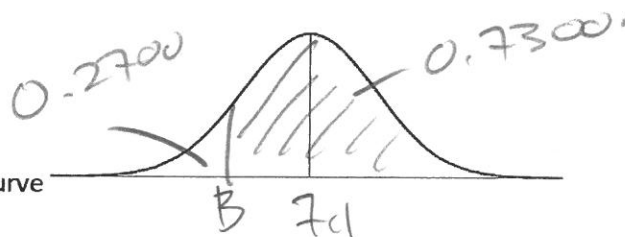
7. Determine the randomly selected a year in which the amount of snowfall in December is in the top 73% of all Decembers over the history of collecting this type of data

What is the associated Z score in this scenario? -0.61 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \geq B) = 0.7300$

What is the associated amount of snowfall with this problem? mean + sd(z) = $7.1 + 1.75(-0.61)$ 6.0325

look up 0.7300
(0.2709)
→ -0.61



Sketch the scenario on the provided normal curve

8. According to the given information, find the missing amount of December snowfall if you know that 63% of the of the years selected are between 5.18 inches and T inches

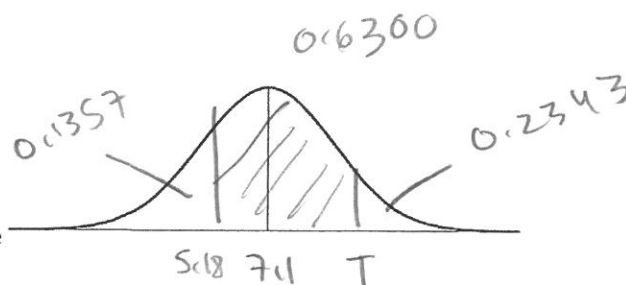
What are the associated Z scores in this scenario? -1.10 and 0.72 Round to TWO decimal places

What is the probability statement for this scenario? $P(5.18 \leq X \leq T) = 0.6300$

What is the missing associated amount of snowfall in December in Peoria with this problem? mean + sd(z) = $7.1 + 1.75(0.72)$ 8.36

$$\frac{5.18 - 7.1}{1.75}$$

look up 0.7657
→ (0.7642)
→ 0.72



Sketch the scenario on the provided normal curve

$$0.1357 + 0.6300 = 0.7657$$

The average cost of car insurance for a person who is 18 years old is \$6456. If the cost of this car insurance for 18 year olds is said to be normally distributed and has a standard deviation of \$175 then answer the following questions:

9. According to the given information, find the missing cost of car insurance if you know that 18% of the these 18 year olds are paying between B and \$6450

What are the associated Z scores in this scenario? -0.03 and -0.5 Round to TWO decimal places

What is the probability statement for this scenario? $P(B \leq X \leq 6450) = 0.1800$

What is the missing associated cost with this problem? $\text{mean} + SD(Z) = 6456 + 175(-0.5)$
 $\$6368.50$ (round to TWO decimal places)

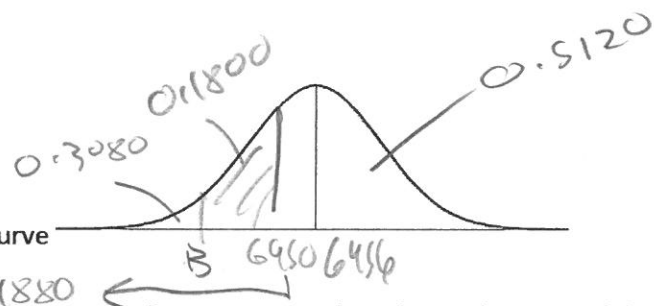
$$\frac{6450 - 6456}{175}$$

look up 0.3080

$\hookrightarrow (0.3085)$

$\hookrightarrow -0.5$

$$0.4880 - 0.1800 = 0.3080$$



Sketch the scenario on the provided normal curve

10. According to the given information, find the missing cost of car insurance if you know that 60% of the these 18 year olds are paying less than \$6100 OR more than W dollars

What are the associated Z scores in this scenario? -2.63 and -0.2 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \leq 6100) \text{ OR } P(X \geq W) = 0.6000$

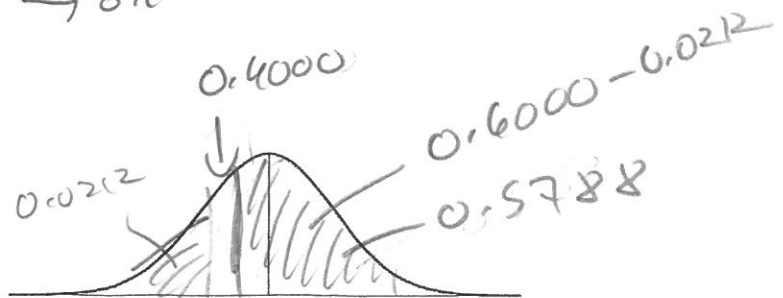
What is the missing associated cost with this problem? $6456 + 175(-0.2) =$
 $\$6421$ (round to TWO decimal places)

$$\frac{6100 - 6456}{175}$$

look up 0.4212

(0.4207)

$\hookrightarrow -0.2$



Sketch the scenario on the provided normal curve

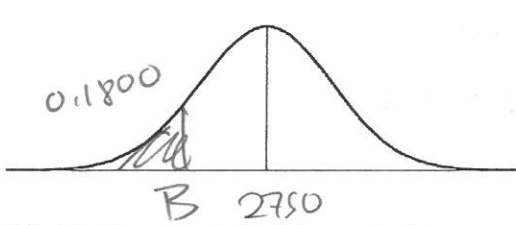
$$0.4212 = 1 - 0.5788$$

Extra Credit: DO NOT ATTEMPT UNTIL ALL OTHER PROBLEMS ARE COMPLETED NO WORK = NO CREDIT

If the average monthly salary of a college graduate is said to be normally distributed and is \$2750 has a standard deviation of \$250 and the average monthly student loan payment is said to be normally distributed at \$806.74 with a standard deviation of \$82.50, then answer the following questions.

If a person is earning a monthly salary in the bottom 18% of all monthly salaries, then what percent of people T have a loan payment higher than that same person, if the person in question has a MAXIMUM TAKE HOME PAY after paying their student loan that is \$1900 (assume the pay is NET PAY and NOT GROSS PAY, that is taxes have been paid already).

Sketch the scenario related average monthly pay on the provided normal curve



look up 0.1800
(0.1788)
-0.92

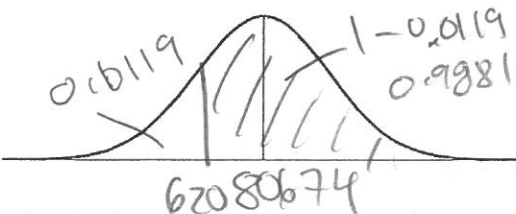
What is the associated Z score in this scenario? -0.92 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \leq B) = 0.1800$

What is the associated amount of monthly pay with this problem? mean + SD(Z) = 2750 + 250(-0.92) \$ 2520

$$\text{PAY} - \text{LOAN} = 1900$$

Sketch the scenario related average monthly student loan payment on the provided normal curve



$$\frac{620 - 806.74}{82.50} = -2.26$$

$$\begin{aligned} \text{LOAN} &= 2520 \\ &- 1900 \\ &= 620 \end{aligned}$$

What is the associated Z score in this scenario? -2.26 Round to TWO decimal places

What is the probability statement for this scenario? $P(X \geq 620) = T$

What is the associated amount of monthly student loan payment with this problem?

620 Round to TWO DECIMAL PLACES

The percentage of people, T, that have a student loan higher than the person whose take home pay of \$1900 after paying their student loan payment (before any other expenses are paid) is 0.9881

JUSTIFY THE ANSWER YOU GAVE or NO extra credit of any type will be awarded

98.81%

MR HICKMAN IS ASKING YOU IF YOU
CAN READ AND INTERPRET THESE
PROBLEMS WELL ENOUGH TO
PERFORM THE MATHEMATICS
INVOLVED.

DO **NOT** ASK HIM TO READ

AND INTERPRET THE QUESTIONS
FOR YOU, BECAUSE IT IS
SPECIFICALLY THE MAJOR LEARNING

TARGET HE IS ASSESSING **YOU**

ON! GOOD LUCK!