Name Solutions Test 2 APPLICATIONS of Normal Curves 11-17-16 Hour 1 2 3 4 5 6 7

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 $1500, Use this information to answer the following questions:

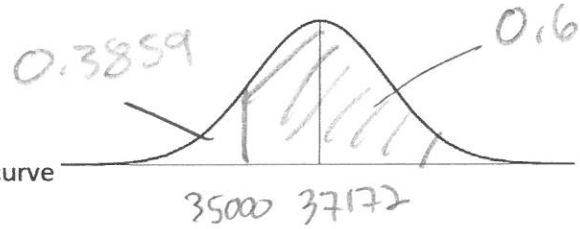
1. You randomly selected a person that has student loan debt, determine the probability that you selected a person that borrowed more than $35000.

   What is the associated Z score in this scenario? -0.29 Round to TWO decimal places $\frac{35000-37172}{7500}$

   What is the probability statement for this scenario? $P(x \geq 35000) = 0.6141$

   What is the associated probability with this problem? 61.41% or 0.6141

   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 $20000 OR more than $25000.

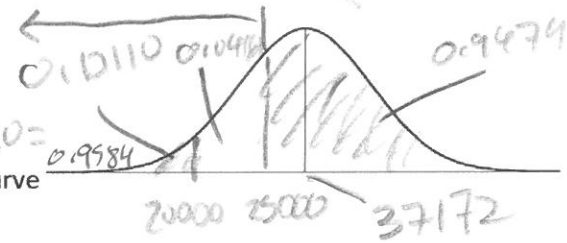
   What are the associated Z scores in this scenario? -2.29 and -1.62 Round to TWO decimal places $\frac{20000-37172}{7500} = -2.29$

   What is the probability statement for this scenario? $P(x \leq 20000)$ or $P(x \geq 25000)$

   What is the associated probability with this problem? $0.9584 = 95.84\%$

   $0.0526 - 0.0110 = 0.0416$ $1 - 0.0416 = 0.9584$ $0.9474 + 0.0110 =$ $\frac{25000-37172}{7500}$

   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 $27500 and $42500.

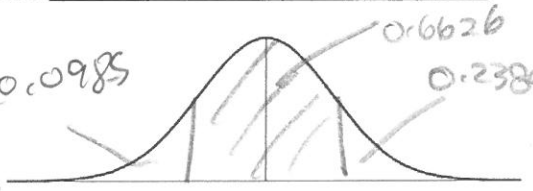
   What are the associated Z scores in this scenario? -1.29 and 0.71 Round to TWO decimal places

   What is the probability statement for this scenario? $P(27500 \leq x \leq 42500) = 0.6626$

   What is the associated probability with this problem? 0.6626 or 66.26%

   $1 - (0.0985 + 0.2389)$ $1 - 0.3374 = 0.6626$ $\frac{27000-42500}{7500}$

   Sketch the scenario on the provided normal curve



$0.7611 - 0.0985 = 0.6626$ 0.7611

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

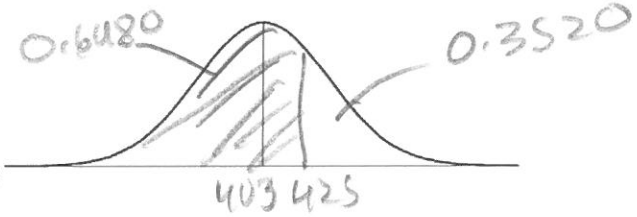
4. You randomly selected a family determine the probability that you selected a family that spent $425 or less on Black Friday Shopping

   What is the associated Z score in this scenario? 0.38 Round to TWO decimal places

   What is the probability statement for this scenario? $P(x \leq 425) = 0.6480$

   What is the associated probability with this problem? 0.6480 64.80%

   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 $385 or less OR more than $450 on Black Friday Shopping

   What are the associated Z scores in this scenario? -0.31 and 0.81 Round to TWO decimal places

   What is the probability statement for this scenario? $P(x \leq 385) \text{ OR } P(x \geq 450) = 0.5873$

   What is the associated probability with this problem? 0.5873 or 58.73%

   0.3783 + 0.2090 = 0.5873

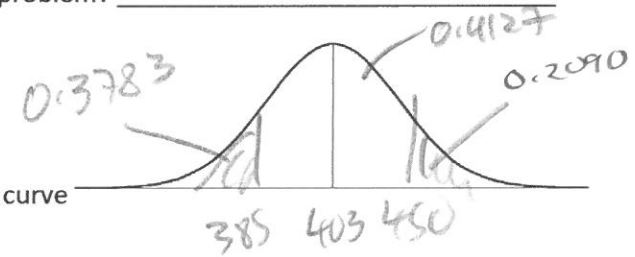
   $1 - (0.3783 + 0.2090)$

   $1 - 0.5873 = 0.4127$

   $\frac{385 - 403}{58}$

   $\frac{450 - 403}{58}$

   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 $450 and $525 on Black Friday Shopping

   What are the associated Z scores in this scenario? 0.81 and 2.10 Round to TWO decimal places

   What is the probability statement for this scenario? $P(450 \leq x \leq 525) = 0.1911$

   What is the associated probability with this problem? 0.1911 or 19.11%

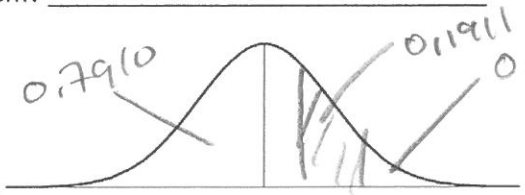
   $0.7910 + 0.0179 = 0.8089$

   $1 - 0.8089 = 0.1911$

   $0.2090 - 0.0179 = 0.1911$

   0.2090

   Sketch the scenario on the provided normal curve



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 85% of all Decembers over the history of collecting this type of data

What is the associated Z score in this scenario? -1.04 Round to TWO decimal places

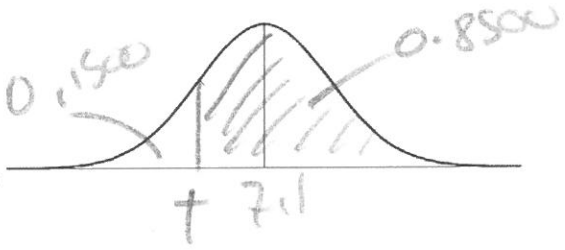
What is the probability statement for this scenario? $P(x \geq t) = 0.8500$

$\text{mean} + SD(z) = 7.1 + 1.75(-1.04)$ 5.28

What is the associated amount of snowfall with this problem? _____

look up 0.1500
(0.1492)
↓
$z = -1.04$

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 58% of the of the years selected are between 5.25 inches and T inches

What are the associated Z scores in this scenario? -1.06 and 0.6 Round to TWO decimal places

What is the probability statement for this scenario? $P(5.25 \leq x \leq T) = 0.5800$

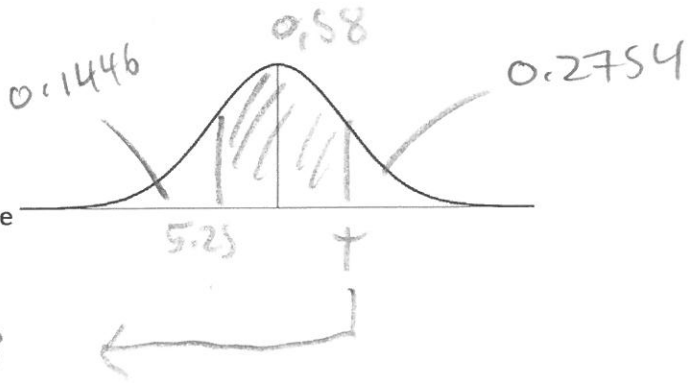
$\text{mean} + SD(z) = 7.1 + 1.75(0.6) =$ 8.15

What is the missing associated amount of snowfall in December in Peoria with this problem? _____

$\frac{5.25 - 7.1}{1.75} = -1.06$

look up 0.7246
(0.7257)
↳ 0.6

Sketch the scenario on the provided normal curve



$0.7246 = 0.1446 + 0.58$

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 15% of the these 18 year olds are paying between B and $6350

What are the associated Z scores in this scenario? -0.61 and -1.17 Round to TWO decimal places

What is the probability statement for this scenario? $P(B \leq x \leq 6350) = 0.1800$

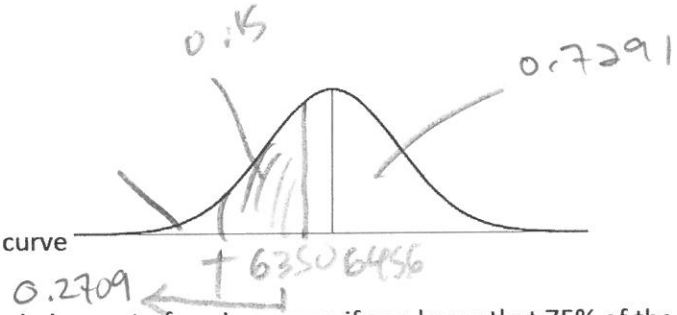
What is the missing associated cost with this problem? $6251.25 (round to TWO decimal places)

$\text{mean} + SD(z) = 6456 + 175(-1.17)$

look up 0.1209
(0.1210)
↳ -1.17

$0.2709 - 0.15 = 0.1209$

$1 + (0.15 + 0.7291) = 0.1209$



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 75% of the these 18 year olds are paying less than $6200 OR more than W dollars

What are the associated Z scores in this scenario? -1.46 and -0.46 Round to TWO decimal places

What is the probability statement for this scenario? $P(x < 6200) \text{ OR } P(x > w) =$

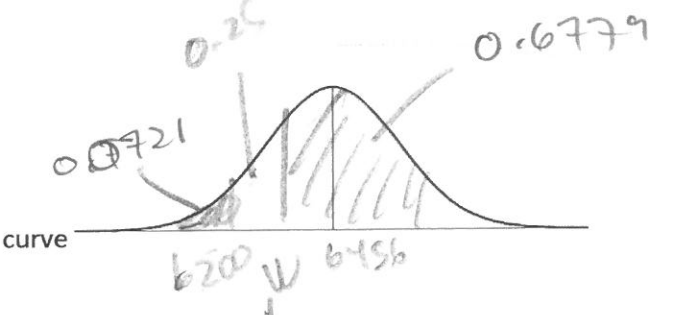
What is the missing associated cost with this problem? $6375.50 (round to TWO decimal places)

$\frac{6200 - 6456}{175} = -1.46$

$\text{mean} + SD(z)$

$6456 + 175(-0.46)$

look up 0.3221
(0.3228)
↳ -0.46



Sketch the scenario on the provided normal curve

$0.3221 = 0.25 + 0.0721$

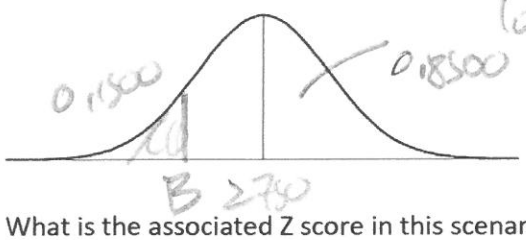
Extra Credit: DO NOT ATTEMPT UNTIL ALL OTHER PROBLEMS ARE COMPLETED NO WORK = NO CREDIT

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 15% of all monthly salaries, then what percent of people T have a loan payment higher that 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 0.1500



2490 - 1900

Pay - 1900 = 590

loan amount

What is the associated Z score in this scenario? -1.04 Round to TWO decimal places

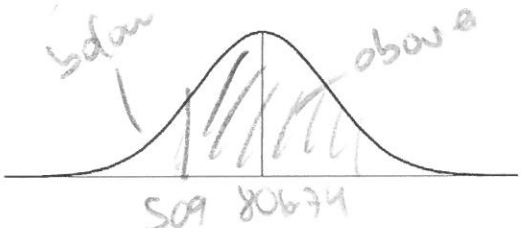
What is the probability statement for this scenario? $P(x \leq B) = 0.1500$

What is the associated amount of monthly pay with this problem? 2490

mean + SD(Z) = 2750 + 250(-1.04)

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

$\frac{590 - 806.74}{82.50} = -2.63$



What is the associated Z score in this scenario? -2.63 Round to TWO decimal places

What is the probability statement for this scenario? $P(x \geq 509) = 0.9957$

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

2490 - 1900

$590 Round to TWO DECIMAL PLACES

who have a

The percentage of people, T, that have a student loan higher than person ~~whose~~ take home pay of $1900 after paying their student loan payment (before any other expenses are paid) is 99.57%

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