Math 145 Quiz 2 Name: Solutions **Row:**

1. Does the following data set have any outliers according to the 1.5 IQR rule? This data represent lengths in centimeters. SHOW YOUR WORK: $10, 32, \underline{38}, 48, 50, \underline{50}, 53, \underline{54}, 55, 55$

lower fence = $Q_1 - 1.5 * IQR = 38 - 24 = 14$

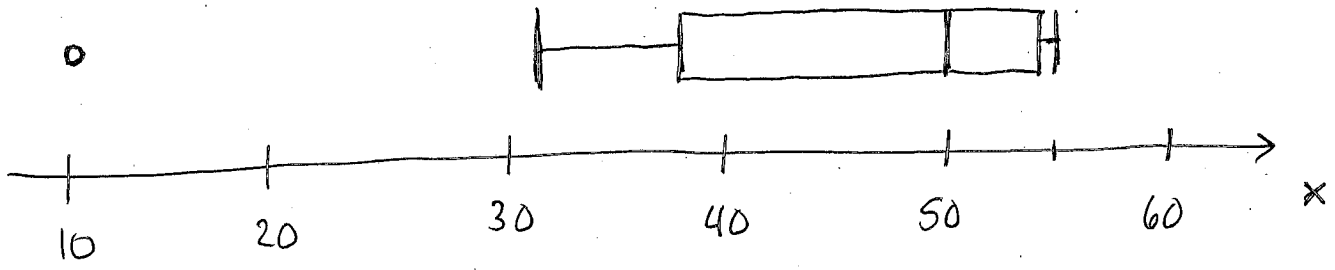
upper fence = $Q_3 + 1.5 * IQR = 54 + 24 = 78$

10 is an outlier.

min = 10
$Q_1 = 38$
$Q_2 = 50$
$Q_3 = 54$
max = 55
IQR = 16
$1.5 * IQR = 24$

(2)

2. Make a modified (shows outliers, if any) box plot for the data set in the previous problem. It should be clearly labeled and have ticks along the data axis, it should not simply be a sketch of what you see on your TI8X screen.



(2)

3. The probability of winning at Wisconsin Megabucks by buying one ticket is exactly

$$\frac{1}{6991908}$$

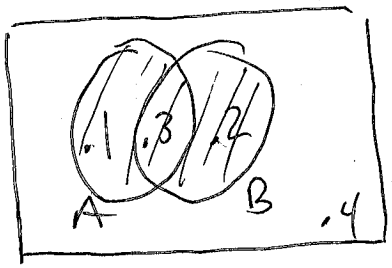
Approximate this probability as a decimal to the correct number of decimal places as we discussed in class.

$1.43 \times 10^{-7} = .0000001\underline{43}$ (3 sig. figures; 7 places (6 zeros))

(2)

4. If $P(A) = .4, P(B) = .5$, and $P(A \cap B) = .3$, then what is $P(A \cup B)$?

$P(A \cup B) = P(A) + P(B) - P(A \cap B) = .4 + .5 - .3 = .6$



$P(A \cup B) = .6$

(2)

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5. This problem refers to the table of 99 pregnancy test results below:

	Positive Test Result (Pregnancy is indicated)	Negative Test Result (Pregnancy is not indicated)	
Subject is pregnant	80 (True positive)	5 (False negative)	
Subject is not pregnant	3 (False positive)	11 (True negative)	

(a) Find the probability that a woman who tests positive is actually pregnant.

$P(\text{pregnant} \mid \text{positive test}) = 80/83 \approx .964$ (1.5)

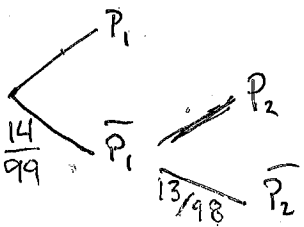
(b) Find the probability that a woman who tests negative is actually pregnant.

$P(\text{pregnant} \mid \text{negative test}) = \frac{5}{16} \approx .313$ (1.5)

(c) Is it unusual for a woman who tests negative to be pregnant? Explain briefly.

No, 31.3% of women who took the test w/ negative results were actually pregnant. This is a relatively large fraction and could not be considered unusual. (1)

(d) Select two women from this group at random, what is the probability that the first is not pregnant and the second is not pregnant?



$P(\bar{P}_1 \cap \bar{P}_2) = \frac{14}{99} * \frac{13}{98} \approx .0188$ (1.5)

(e) What is the probability a woman tests negative or is not pregnant?

$\frac{5+11+3}{99} = \frac{19}{99} \approx .192$ (1.5)