Math 206 - Test 2
Chapters 10 and 11

Name Key

Show all work to receive full credit. Partial credit may be given. This test is due in its D2L assignment folder on or before 11:59pm on Wednesday.

1. (9pts) The speeds in miles per hour of 16 cars were checked by radar. The data are as follows:

72	62	67	69	72	75	58	84
74	67	68	71	45	67	62	75

(a) Find the median, upper quartile and lower quartile for this data.

45 58 62 62 67 67 67 68 | 69 71 72 72 74 75 75 84

3pts $Q_1 = 64.5$ (LQ); Median 68.5; $Q_3 = 73$ (UQ)

(b) Draw and label a box and whisker plot for this data.

2pts

(c) Are there any outliers in this data set? (Justify your yes or no answer.)

$IQR = 73 - 64.5 = 8.5$

4pts upper outliers? $73 + 1.5(8.5) = 85.75$ No upper outliers (+2)

lower outliers? $64.5 - 1.5(8.5) = 51.75$ So, 45 is an outlier. (+2)

2. (4pts) Set A has a mean of 45 and a cardinality of 30. Set B has a mean of 65 and a cardinality of 40. Find the mean of $A \cup B$. (Hint: It's not 55.)

Set A: $\frac{\text{sum } A}{30} = 45$ (+1) Set B: $\frac{\text{Sum } B}{40} = 65$ (+1)

Sum A = 1350 Sum B = 2600

$A \cup B$: $\frac{\text{sum } A + \text{sum } B}{70} = {}^{1}\frac{1350 + 2600}{70} \approx 56.43$ (+1) (+1)

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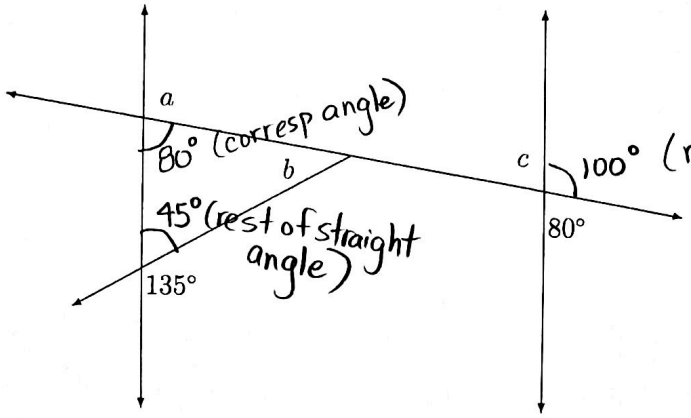
3. (3pts) In the figure below, the two vertical lines are parallel. Find each of the following. Briefly explain your answers.



(a) m(∠ a) = 100° corresponding angles

+1 each

(b) m(∠ b) = 55° sum of angles in a triangle

(c) m(∠ c) = 80° vertical angles

4. (4pts) A regular polygon has a vertex angle that measures approximately 176.9°. Approximately how many sides does this polygon have? (No credit will be awarded for guessing and checking.)

(+1) $\frac{(n-2)(180)}{n} = 176.9 \Rightarrow 180n - 360 = 176.9n$ (+1)

$\Rightarrow -360 = -3.1n$ (+1)

2 $\Rightarrow \boxed{116 = n}$ (+1)

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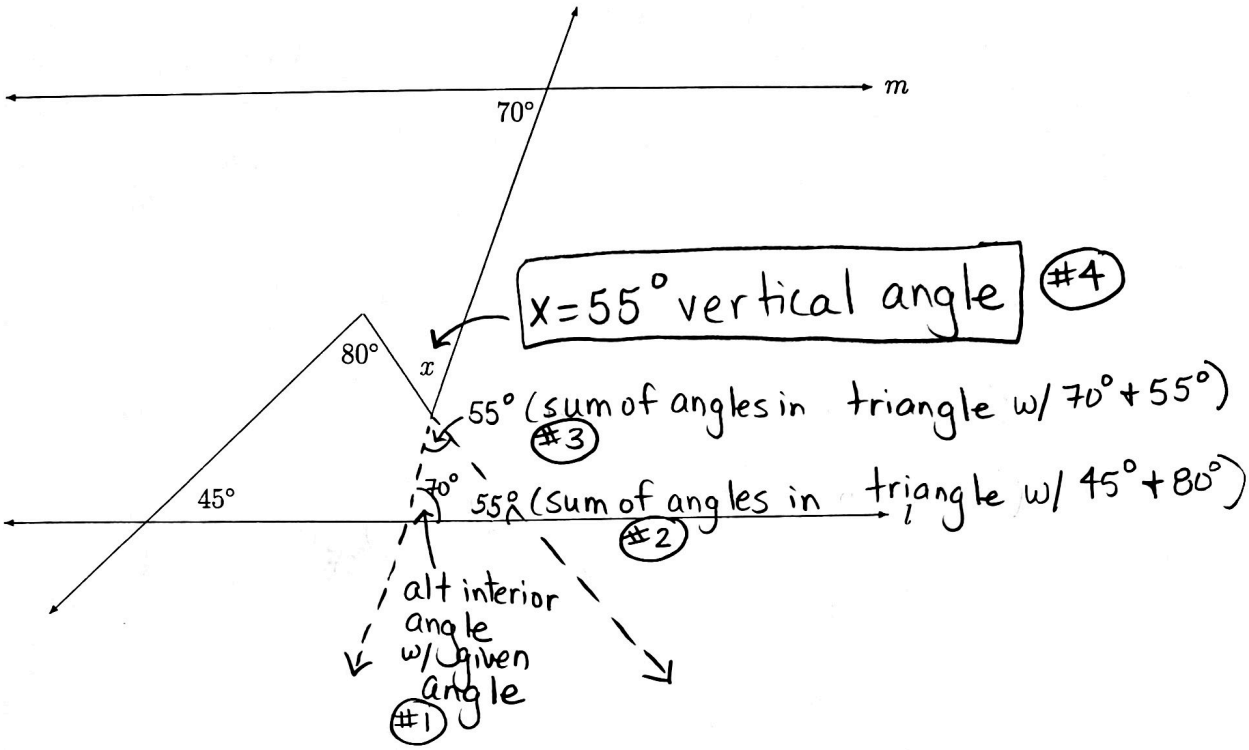
5. (4pts) In the figure below l is parallel to m. Find the value for x. Briefly explain your answer.



+1 each step

6. (5pts) Make up an example of a SINGLE data set that has ALL of the following characteristics. There will be a little guess & check involved.

(a) 11 data points
(b) Median of 26
(c) Mean of 22
(d) Mode of 32
(e) Standard Deviation between 5 and 15

answers will vary

+1 each

2, 8, 12, 18, 25, 26, 27, 29, 31, 32, 32

Med

mode

$\bar{x} = 22$
$n = 11$
$\sigma = 9.96$
Med = 26
Mode = 32

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7. (8pts) Choose the single most appropriate graph for each situation. Briefly explain your choice.

(a) the results of a survey asking the favorite vegetable from each student in a 4th grade class (Line, (Bar) Histogram)

No in-between data

No intervals

Categorical data

+2 each

(b) the price of Bitcoin from January 2020-today (Line) Bar, Pie)

time-series data

Not categorical data

Not a whole divided into parts

(c) the results of a survey asking shoppers to choose which stores they have shopped at in the past month (Histogram, (Bar) Pie)

No intervals

shoppers can pick more than 1 store, so the total won't be 100%

Categorical data

(d) the results of a survey asking people which category best fits them: homeowner, renter, or neither (Histogram, Line, (Pie))

No overlap in what people pick so the total will be 100%

No intervals

No in-between data

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8. (5pts) There is a separate link to a 26 second video showing 5 different solids. Watch this video then classify each as either a prism, cylinder, cone, pyramid, or neither.

(a) Red Solid (half oval base)

Cylinder - Parallel, Congruent bases
Not a polyhedron

(b) Yellow Solid (quadrilateral base)

Prism - Parallel, Congruent bases and rectangular sides

+1 each

(c) Orange Solid (quadrilateral base)

Prism

(d) Cyan Solid (clover base)

Cylinder

(e) Blue Solid (star base)

Prism

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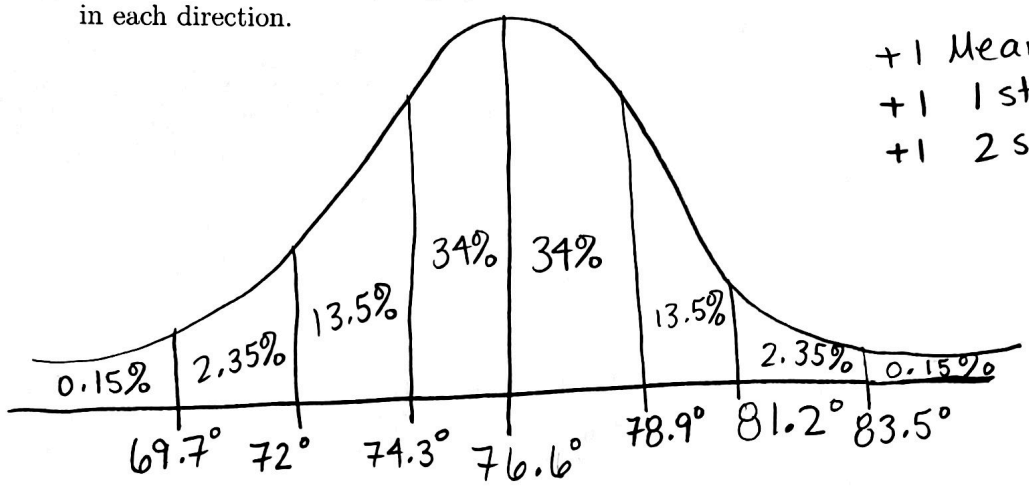
9. (8pts) The average high temperature during June in Chicago Heights is normally distributed with a mean 76.6° and a standard deviation of 2.3°.

(a) Draw a normal distribution graph and label the mean and 2 standard deviations in each direction.

3pts



+1 Mean
+1 1 st dev
+1 2 st dev

(b) Using this graph along with the standard normal distribution graph, what percent of days in June will have an average high temperature:

i. above 69.7°?

2pts

$2.35\% + 13.5\% + 34\% + \underbrace{34\% + 13.5\% + 2.35\% + 0.15\%}_{50\%}$

$= \boxed{99.85\%}$

ii. between 74.3° and 81.2°?

1pt

$34\% + 34\% + 13.5\% = \boxed{81.5\%}$

iii. less than 78.9°?

2pts

$\underbrace{34\% + 34\%}_{50\%} + 13.5\% + 2.35\% + 0.15\% = \boxed{84\%}$

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