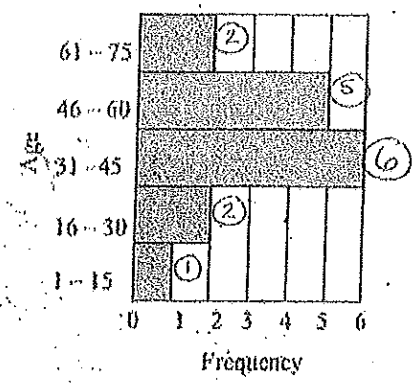
Name: KEY Per: Date:

Pre-Algebra Ch. 8 Group Review

1) Angelica surveyed the ages of the people at the school play. She made a histogram as shown here.

a) How many people were at the play?



2 + 5 + 6 + 2 + 1

Ans: 16 people

b) Which of these stem and leaf plots would match the histogram data?

A

0	8
1	5 9
2	9
3	2 7 7 9
4	3 4 8
5	2 3 5
6	
7	1 2

B

0	8
1	9
2	9
3	2 7 9
4	3 4 8
5	2 3 5
6	0 4
7	1 2

C

0	8
1	9
2	9
3	2 7 7 9
4	3 4 8
5	2 3 5
6	0
7	1 2

6 from 31–45

2

D

0	5 9
1	
2	9
3	7 7 9
4	3 4 8 8
5	2 3 5
6	0
7	1 2

Ans: C

2) Create two versions of a question about the food served at your school. Write one question that is biased and the other which is not biased.

Biased: Isn't the food served at your school cafeteria delicious? I really like it!

Unbiased: Do you like the food options served at your school, yes or no?

3) If you were to conduct a survey in your school asking students about time spent on homework per school night, provide one example that will yield bias results and another example that will yield unbiased results.

Biased: If you sampled only a certain grade level or say the Geometry class, you would get bias results.

Un-Biased: If you randomly chose around 50 students from each grade level in their homeroom class.

4) Lucy has been training for an upcoming marathon. She has kept track of how many miles she runs every day for the past three weeks: 12, 15, 7, 14, 12, 9, 16, 15, 18, 20, 18, 14, 22, 10, 12, 9, 18, 22, 13, 10 and 21.

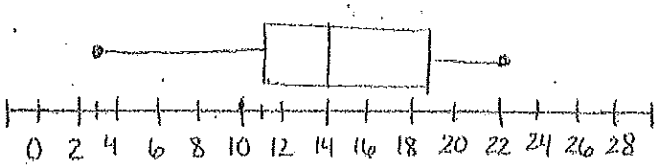
a) Construct a combination histogram and box-whisker plot for this set of data. Use intervals of width equal to 3. Calculate the mean and show it on your diagram.

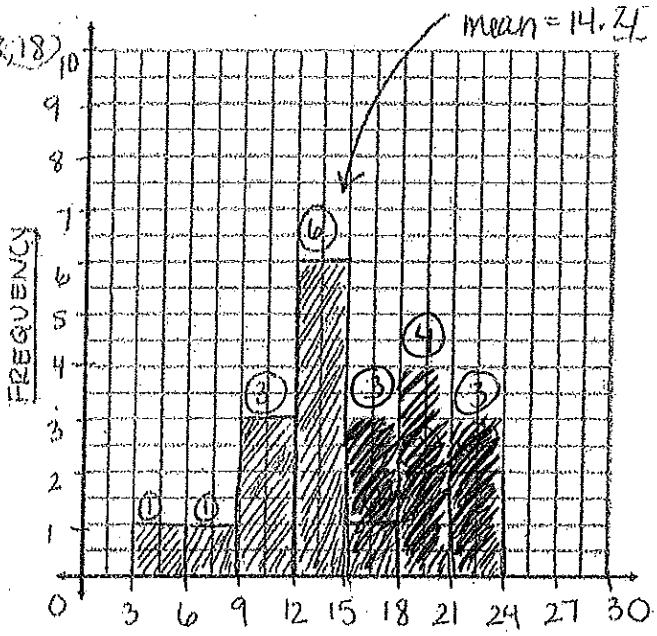
3, 7, 9, 10, 10, 12, 12, 12, 13, 14, 14, 15, 15, 16, 18, 18, 19, 20, 21, 22, 22.

Order Data and find the 5 critical values (box-whisker plot)

Min = 3 Q1 = 11 Q3 = 18.5

Max = 22 Med = 14.





Construct a frequency table (histogram).

STEM	LEAF
0	3 7 9
1	0 0 2 2 2 3 4 4 5 5 6 8 9
2	0 1 2 2

$$\frac{40+64+39+36+13+28+30+16+36}{21} = \frac{302}{21}$$

Mean: ≈ 14.4 miles (round to tenths)

b) What is the probability her coach chooses a day from this list from the last three weeks with more than 13 miles listed?

$$P(13^{+}\text{ miles}) = \frac{12}{21} = \boxed{\frac{4}{7}}$$

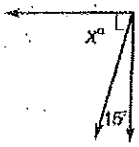
Reduce

c) Which measure of central tendency should Lucy report to her coach if she wants to impress him? Why?

Lucy should report the (mean) because it is a higher # than the median and the data looks fairly symmetrical from the histogram.

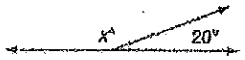
mean ≈ 14.4 median $= 14$

5) Solve each of the following angle problems for the given unknown. Write an equation and solve it for each.

a) 

$90 - 15 = 75°$

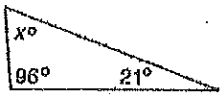
Ans: 75°

b) 

$180 - 20$

160

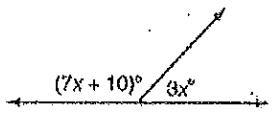
Ans: 160°

c) 

$180 - 96 - 21$

$180 - 117$

Ans: 63°

d) 

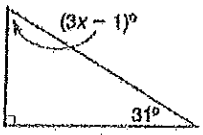
$7x + 10 + 3x = 180$

$10x + 10 = 180$

$10x = 170$

$x = 17$

Ans: 17

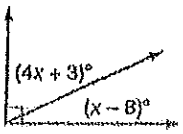
e) 

$3x - 1 + 31 = 90$

$3x + 30 = 90$

$3x = 60$

Ans: 20

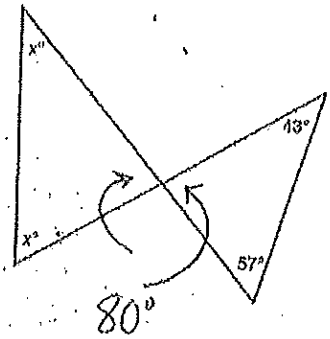
f) 

$4x + 3 + x - 8 = 90$

$5x - 5 = 90$

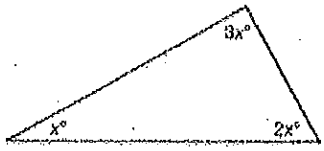
$5x = 95$

Ans: 19

g) 

$80°$

Ans: 50°

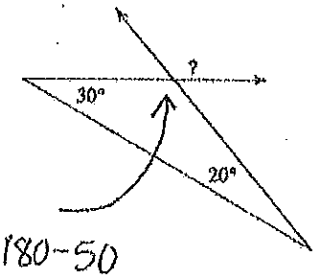
h) 

$x + 3x + 2x = 180$

$6x = 180$

$x = 30$

Ans: 30°

i) 

$180 - 50$

$130°$

Ans: 130°

6) Use the formula $d = r \cdot t$ to solve the following problem: ***On a car trip, Sofia traveled 305 miles in 5 hours. What was her rate of speed?***

$$\frac{305}{5} = \frac{5(r)}{5}$$

Ans: 61 mph

7) Mr. Large gave his waiter a 25% tip on a $81 bill. How much was the tip, and what was the total paid?

$$\text{Tip} = .25(81)$$
$$= 20.25$$

Tip: $20.25

Total = tip + bill

Total Paid: $101.25

8) Solve each percent problem by setting up a proportion equation or writing a one-step equation then solving it showing all support work.

a) 90 is what percent of 33?

$$\frac{90}{33} = \frac{x(33)}{33}$$

$$2.\overline{72} = x$$

Ans: $272.\overline{72}\ \%$

b) 250% of what number is 35?

$$2.50(x) = 35 \quad \text{or} \quad \frac{250}{100} = \frac{35}{x}$$

Ans: 14

9) The price of one share of common stock of Widget.com rose from $1.75 to $5.25.

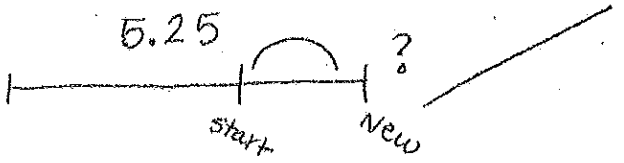
a) What is the percent increase?

$$\frac{\text{difference}}{\text{original}} \times 100$$

$$\frac{3.5}{1.75} \times 100$$

Ans: 200 %

~~b)~~ ***BONUS:*** Find the price for one share of the stock if it rose the same percent again (beginning at $5.25)?



Ans: SKIP THIS

10) Solve and graph each inequality:

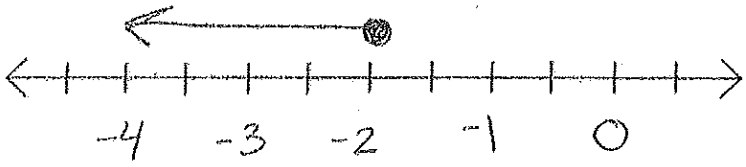
a) $2(y-4) \leq -12$

$2y - 8 \leq -12$

$+8 \quad +8$

$\frac{2y}{2} \leq \frac{-4}{2}$

$y \leq -2$



Inequality: $y \leq -2$

b) $-4x + 8 \geq 2x - 2(x-7)$

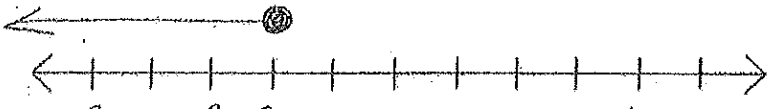
$-4x + 8 \geq 2x - 2x + 14$

$-4x + 8 \geq 0 + 14$

$-4x + 8 \geq 14$

$-8 \quad -8$

$\frac{-4x}{-4} \geq \frac{6}{-4}$ ↙



Inequality: $x \leq -\frac{3}{2}$

11) Which is more: 40% of 200 or 60% of 130? Prove it by showing mathematical evidence (in other words...show your work).

$.40(200)$ → 80

$.60(130)$ → 78

Ans: 40% of 200

12) Solve each equation. Check your solutions.

a) $\frac{2}{5}x+\frac{1}{3}=1$

$\frac{2}{5}x=1-\frac{1}{3}$

$\left(\frac{5}{2}\right)\frac{2}{5}x=\frac{2}{3}\left(\frac{5}{2}\right)$

Ans: $x=5/3$

b) $\frac{1}{6}x+\frac{1}{8}=2\frac{7}{8}$

$\frac{1}{6}x=2\frac{7}{8}-\frac{1}{8}$

$2\frac{3}{4}$

$\frac{1}{6}x=2\frac{6}{8}$

$\left(\frac{6}{1}\right)\frac{1}{6}x=\frac{11}{2}\left(\frac{6}{1}\right)^{3}$

Ans: $x=33/2$ or 16.5

c) $5=\frac{x}{7}-12$

$+12 \quad +12$

$(7)17=\frac{x}{7}\cdot(7)$

Ans: $x=119$

d) $-\frac{m}{4}+12=62$

$-12 \quad -12$

$(-4)-\frac{m}{4}=50(-4)$

$m=-200$

Ans: $m=-200$

13) Solve each proportion. Check your solution.

a) $\frac{17}{51}=\frac{x}{24}$

$\frac{1}{3}=\frac{x}{24}$

$\frac{3x}{3}=\frac{24}{3}$

Ans: $x=8$

b) $\frac{8}{5}=\frac{20}{y}$

$5(20)=8y$

$\frac{100}{8}=\frac{8y}{8}$

$\frac{25}{2}$

Ans: $\frac{25}{2}$ or 12.5

c) $\frac{x-2}{3} = \frac{x+2}{9}$

$9(x-2) = 3(x+2)$

$9x - 18 = 3x + 6$

$-3x \quad -3x$

$6x - 18 = 6$

$+18 \quad +18$

$6x = 24$

Ans: $x = 4$

d) $\frac{5}{2} = \frac{y-2}{2y-4}$

$5(2y-4) = 2(y-2)$

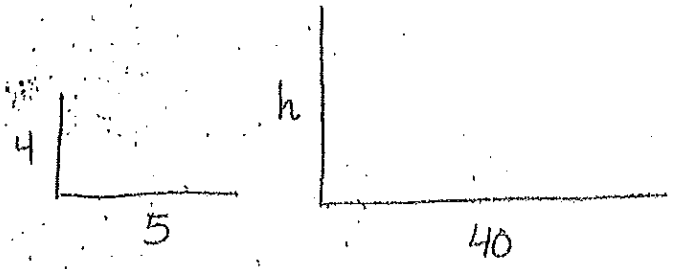
$10y - 20 = 2y - 4$

$\frac{8y}{8} = \frac{16}{8}$

Ans: $y = 2$

14) A four-foot post casts a five-foot shadow at the end of the day. At the same time, a nearby tree casts a 40-foot shadow. How tall do you think the tree is? Justify your answer by sketching the situation and writing a proportion comparing "corresponding parts."

Sketch Here



Calculations Here

$\frac{4}{5} = \frac{h}{40}$

OR

$\frac{4}{h} = \frac{5}{40}$

$\frac{4}{h} = \frac{1}{8}$ $\quad h = 4(8)$

$h = 32$

height of tree: 32 ft

15) Simplify each of the following expressions.

a) $(2x^2 + 4x - 17) + 3(x^2 - 2x + 7)$

$2x^2 + 4x - 17 + 3x^2 - 6x + 21$

Ans: $5x^2 - 2x + 4$

b) $(5x^2 + 9x + 6) - (2x^2 + 2x + 5)$

$5x^2 + 9x + 6 - 2x^2 - 2x - 5$

Ans: $3x^2 + 7x + 1$

c) $-7(12-2f)+4(9f-19)$

$-84+14f+36f-76$

$-84+50f-76$

$-160+50f$

OR

Ans: $50f-160$

d) $\frac{2}{5}(15w-45)+\frac{3}{4}(12+32w)$

$\frac{2}{5}\cdot\frac{15w}{1}-\frac{2}{5}\cdot\frac{45}{1}+\frac{3}{4}\cdot\frac{12}{1}+\frac{3}{4}\cdot\frac{32w}{1}$

$6w-18+9+24w$

$6w-9+24w$

$30w-9$

OR

Ans: $-9+30w$

16) Construct each of the following:

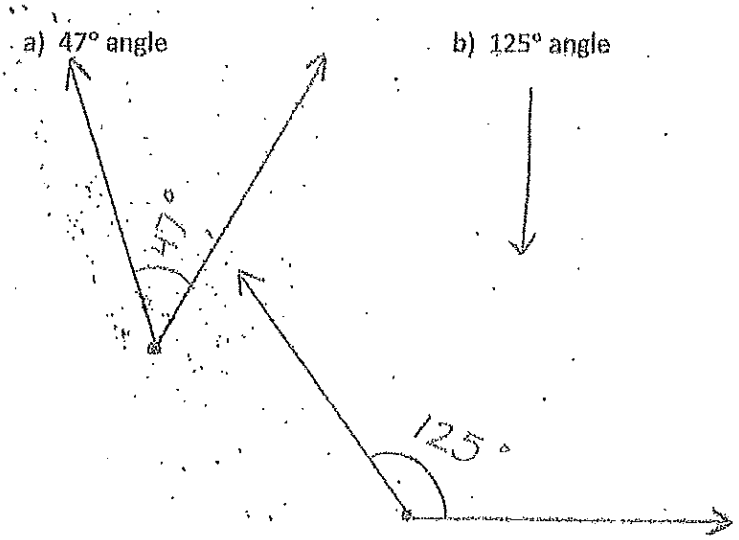
a) 47° angle

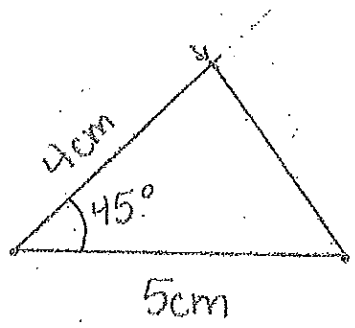
b) 125° angle

c) triangle with sides of length 5" and 4 " and a 45° angle between the two sides

cm

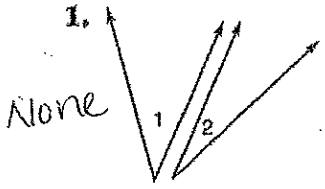
to fit on page





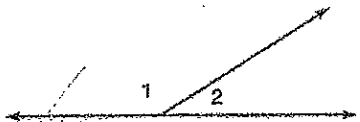
17) Classify each "pair of angles" as adjacent, vertical, complementary, or supplementary Write all that apply. Then use a protractor and measure the angles in #4, writing each angle measure inside their respective angle.

1.



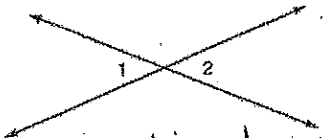
None

2.



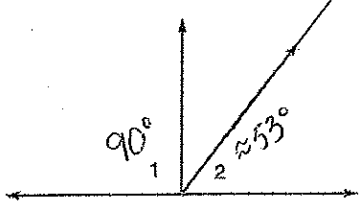
adjacent and supplementary

3.



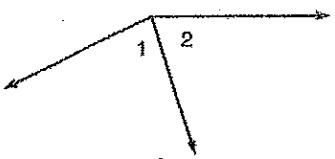
vertical

4.



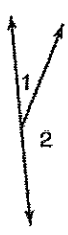
None

5.



adjacent

6.



adjacent and supplementary

18) Write an equation that would enable you to solve the following problem, then solve it.

Marta's jump rope is 25 inches shorter than one and half times the length of Dilbert's rope. If both their ropes laid together end to end measure 221 inches long, how long is Marta's jump rope?

SUM

Dilbert's: x

Marta's: $\frac{1}{2}x - 25$

$\frac{1}{2}(164) - 25$

$82 - 25$

$x + \frac{1}{2}x - 25 = 221$

$2\frac{1}{2}x - 25 = 221$

$\left(\frac{2}{5}\right)\frac{5}{2}x = 246\left(\frac{2}{5}\right)$

$x = 98\frac{2}{5}$

Ans: $122\frac{3}{5}$ in

19) Solve each of the following equations. Check at least one of the solutions.

a) $-3(-2x+4) = 3x+9$

$6x - 12 = 3x + 9$

$-3x \quad -3x$

$3x - 12 = 9$

$+12 \quad +12$

$3x = 21$

Ans: $x = 7$

✓

$-3(-14+4) = -3(-10)$

$3(7)+9 = 21+9$

$30 = 30$

✓

it works

b) $4x - 4(3-2x) = -(2x+3) - 8 + 6x$ — distribute the negative one

$4x - 12 + 8x = -2x - 3 - 8 + 6x$

$12x - 12 = 4x - 11$

$+12 \quad +12$

$12x = 4x + 1$

$-4x \quad -4x$

$8x = 1$

$x = \frac{1}{8}$

Ans: $\frac{1}{8}$

c) Solve for x: $-2x + \frac{3}{7}(21x + 63) - 5x = -5(x+7) + 4x$

$-2x + \frac{3}{7}\cdot\frac{21x}{1} + \frac{3}{7}\cdot\frac{63}{1} - 5x = -5x - 35 + 4x$

$-2x + 9x + 27 - 5x = -x + 35$

$7x + 27 - 5x = -x - 35$

$2x + 27 = -x - 35$

$3x = -35 - 27$

$3x = -62$

$x = \frac{-62}{3}$

$-20\frac{2}{3}$

OR $-20.\overline{6}$

Ans: $\frac{-62}{3}$

20) The formula for simple interest is I = Prt. Find the principal (P) if you earn $300 in interest (I) at a rate of 5% (r) for 6 years. Then determine the total amount of money (principal + interest).

$I = Prt$

$300 = (P)(.05)(6)$

$\frac{300}{.3} = \frac{(P)(.3)}{.3}$

$1000 = (P)$

Ans: $\$1300 = P$

$.3\overline{)300.0}$

$3\overline{)3000}$

1000

-3000

☺

21) Suppose $1000 is deposited in an account earning an unknown annual interest rate. If the money is left undisturbed and the balance of the account in ten years is $1800, what is the simple interest rate?

$1800 - 1000 = 800$

$I = Prt$

$800 = 1000(r)(10)$

$\frac{800}{10{,}000} = \frac{10{,}000}{10{,}000}r$

$r = \frac{800}{10{,}000} = \frac{8}{100} = 8\%$

$.08$

as a percentage

Ans: 8%

22) When Aaron was 10 years old, he inherited $10,000 from his grandmother. He had to choose between investing the money into an account that would pay 6.67% simple interest each year, and leaving the money in that account for six years, or, he could choose another account that pays only 6% but he could leave the money in that account for ten years. What would you advise Aaron to do?

The 2nd option at 6% for 10 yrs.

Ans:

First Account

$I = 10{,}000(.0667)(6)$

$I = 10{,}000(.4002)$

$I = 4{,}002$

Total 14,002

Second Account

$I = 10{,}000(.06)(10)$

$I = 10{,}000(.6)$

$I = 6{,}000$

Total 16,000

(")

23) Poor Albert! He lost his job right after starting college and now he needs $5,000 fast to pay for fees. The bank will give him a one-year loan at 6% interest rate. At the end of the year, he must pay back the loan and all the interest. What will he be paying in one year's time? Show your work.

$P = \$5000$

$r = .06$ (6%)

$t = 1$ year

$I = ?$

Total = ?

$I = 5000(.06)(1)$

$I = 300$

Total = 5000 + 300

$5,300

Ans: $5300