

ACP Statistics Summer Packet

Have this packet completed for the first day of school. These are a few important and fundamental skills for this class. There are examples for each skill for you to follow.

This will count as your first grade of the year. Enjoy!

Summation Notation

This may be new for you. Take a look at the examples and complete the three problems.

Example 1: $\sum_{k=1}^5 3k$ <u>Solution</u> $3(1) + 3(2) + 3(3) + 3(4) + 3(5) =$ $3 + 6 + 9 + 12 + 15 = \mathbf{45}$	Example 2: $\sum_{k=1}^4 k^2$ <u>Solution</u> $1^2 + 2^2 + 3^2 + 4^2 = 1 + 4 + 9 + 16 = \mathbf{30}$
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Directions: Evaluate each expression. Show work.

A. $\sum_{k=1}^{11} (2k - 7)$

Answer: _____

B. $\sum_{k=1}^9 (8k^2 - 3k)$

Answer: _____

C. $\sum_{k=1}^{10} (4k^2 - 2k + 8)$

Answer: _____

Slope of a Line

Slope Formula: $m = \frac{y_2 - y_1}{x_2 - x_1}$

Example 1: Find the slope of the line that passes through (1, 2) and (3, 4).

Solution

$$\frac{2-4}{1-3} = \frac{-2}{-2} = \mathbf{1}$$

Example 2: Find the slope of the line that passes through (3, 6) and (1, 8).

Solution

$$\frac{8-6}{1-3} = \frac{2}{-2} = \mathbf{-1}$$

Directions: For the problems below, find the *slope of the line* between each of the two given points. Show work. Write your answer in simplest form.

A. (1, 5) and (7, 8)

Answer: _____

B. (-5, 9) and (5, 11)

Answer: _____

C. (12, 13) and (7, 13)

Answer: _____

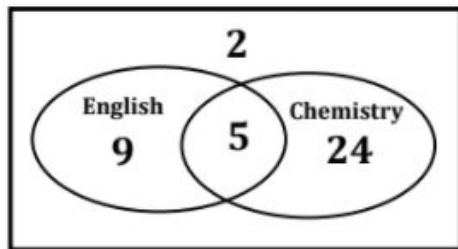
D. (-8, 2) and (-8, 7)

Answer: _____

Venn Diagrams

Example 1: Out of forty students, 14 are taking English Composition and 29 are taking Chemistry. If five students are in both classes, how many students are in neither class?

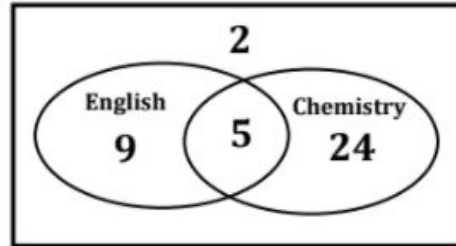
Solution



Two students are taking neither class.

Example 2: Out of forty students, 14 are taking English Composition and 29 are taking Chemistry. If five students are in both classes, how are in either class?

Solution



There are 38 students in at least one of the classes.

Directions: Create a Venn diagram to display the information then solve.

- A. In a class of 87 students, 40 take Chorus, 53 take Band, and 16 take both Chorus and Band. How many students in the class are not enrolled in either Chorus or Band?

B. In a school of 800 students, 185 students are taking Spanish, 160 students are on sports teams, and 72 students participate in both activities. How many students don't participate in either activity?

C. A veterinarian surveys 46 of his patrons. He discovers that 17 have hamsters, 21 have guinea pigs, and 19 have birds. Eight have hamsters and guinea pigs, and 5 people have a guinea pig and a bird. Seven have hamsters and a bird, and of these, 3 people have a guinea pig. How many patrons have none of these pets?

Writing Equations of Lines

Slope-Intercept Form

Slope Intercept Form: $y = mx + b$

Example 1: Find the slope of the line that passes through (1, 2) and has a slope of 5.

Solution

Plug in the slope (m) and point (x, y), then solve for b:

$$\begin{aligned}y &= mx + b \\2 &= 5(1) + b \\2 &= 5 + b \\-3 &= b\end{aligned}$$

Now take $m = 5$ and $b = -3$. Plug them in to write your equation in slope-intercept form:

$$y = 5x - 3$$

Example 2: Find the slope of the line that passes through (1, 4) and (3, 10).

Solution

Find the slope first: $\frac{10-4}{3-1} = \frac{6}{2} = 3$

Use the $m = 3$ and any point and plug it in to solve for b:

$$\begin{aligned}y &= mx + b \\4 &= 3(1) + b \\4 &= 3 + b \\1 &= b\end{aligned}$$

Now take $m = 3$ and $b = 1$ and write your equation in slope-intercept form:

$$y = 3x + 1$$

Directions: Write the equation of the line using the given information. Show work.

A. Passes through (2, 4); slope of 3

Answer: _____

B. Passes through $(-5, 8)$; $m = \frac{1}{5}$

Answer: _____

C. Passes through $(0, 0)$; $m = -4$

Answer: _____

D. Passes through $(5, 1)$ and $(3, 0)$

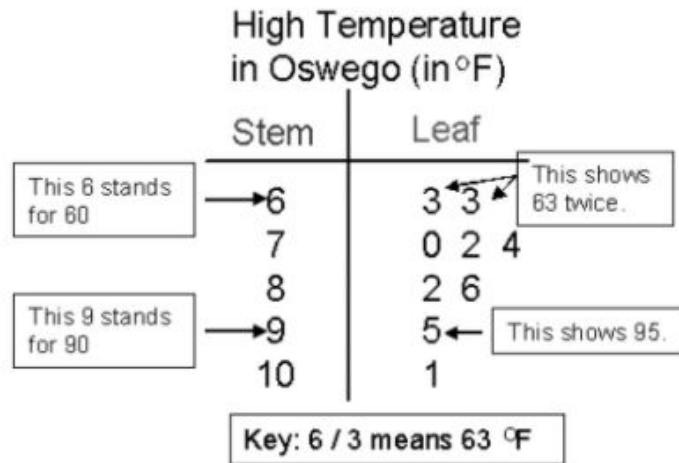
Answer: _____

E. Passes through $(-2, 3)$ and $(-2, -1)$

Answer: _____

Stem-Leaf Plots

Example: Create a Stem and Leaf plot for the following temperatures (in degrees). 63, 63, 70, 72, 74, 82, 86, 95, 101



Directions: Create a stem and leaf plot, with a key, for each set of data.

A. Data: 12, 13, 20, 21, 25, 25, 28, 34, 36,
39, 53, 54, 54, 54, 56, 62, 65, 66,
66, 67, 68, 80, 83, 85, 98

B. Data: 45, 10, 79, 33, 15, 30, 26, 49,
53, 11, 28, 54, 42, 77, 33, 11,
36, 84, 58, 27, 47, 21, 43, 31,
19, 37, 45, 23, 71, 33

Measures of Central Tendencies

Mean

The mean is the average value in a group of numbers: also called the norm.

Add all of the values together to find the total

$4+5+5+6+8+8 = 36$

There are 6 values

Divide the total by the number of values

$36 \div 6 = 6$

The mean is **6**

Median

The median is the middle value in a group of numbers

Place all of the values in order

$2, 4, 4, 5, 6, 7, 9$

There are 7 values

The median is the middle value

$2, 4, 4, 5, 6, 7, 9$

The median is **5**

If there are two middle values, find the mean of those two.

Mode

The mode is the most frequent value in a group of numbers

Count how many there are of each value

$3, 4, 4, 5, 5, 7, 8, 9$

The mode is the number that appears most often: you can have more than one!

The modes are **4** and **5**

Range

The range is the difference between the lowest and highest values in a group of numbers

Find the lowest and highest values

$3, 3, 4, 5, 6, 7, 10, 12$

Subtract the lowest value from the highest value

$12 - 3 = 9$

The range is **9**

Directions: Find the mean, median, mode, and range for each. Show work.

A. 11, 10, 12, 12, 9, 10, 14, 12, 9

Mean: _____

Median: _____

Mode: _____

Range: _____

B.

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

Mean: _____

Median: _____

Mode: _____

Range: _____