

- 1.) How many terms were added together for a geometric series whose first term is 4, common ratio is 3, and sum is 1,062,880?

$$1062880 = \frac{4(1-3^n)}{(1-3)}$$

$$-2125760 = 4(1-3^n)$$

$$-531440 = 1-3^n$$

$$-531441 = -3^n$$

$$531441 = 3^n$$

$$\log 531441 = n \log 3$$

$$n = 12$$

→ 12 terms

- 2.) What is the sum of an arithmetic series whose eleventh term is 75, seventeenth term is 117, and last term is 236?

$$\textcircled{1} 75 = a_1 + 10d$$

$$117 = a_1 + 16d$$

$$-42 = -6d$$

$$d = 7$$

$$\textcircled{2} 75 = a_1 + 10(7)$$

$$a_1 = 5$$

$$\textcircled{3} 236 = 5 + 7(n-1)$$

$$231 = 7n - 7$$

$$n = 34$$

$$\textcircled{4} S_{34} = \frac{34}{2}(5 + 236)$$

$$= 4097$$

- 3.) Hank is trying to create a password for his phone. The password can be 5 characters. The first two characters must be letters, the middle character must be a number, and the last two characters must be a vowel. The characters of the password cannot repeat. How many different passwords can Hank make?

$$26 \times 25 \times 10 \times 3 \times 2$$

$$= 39,000 \text{ possible passwords}$$

- 4.) Cammie has a bag of marbles containing 4 red, 3 yellow, 2 green, and 5 blue. She selects 2 marbles at random. Which scenario has a greater chance of happening?

14 marbles total

- a.) Selecting a yellow and then a blue, no replacement.

$$\frac{3}{14} \cdot \frac{5}{13} = \frac{15}{182} = 8.2\%$$

- b.) Selecting two yellows or two blues.

$$\frac{3C2}{14C2} + \frac{5C2}{14C2} = \frac{3+10}{91} = \frac{13}{91} = 14.3\%$$

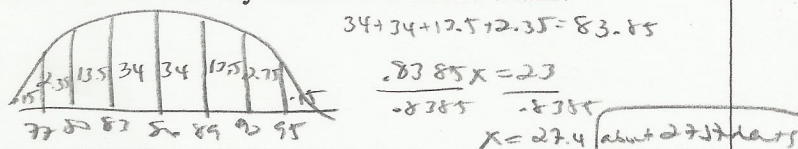
- 5.) A class has test scores: 76, 52, 82, 95, 76, 92, 99, 85, 89, 64, 78, 82, 76, 95. What are the measures of central tendency?

$$\text{mean} = 81.5$$

$$\text{median} = 82$$

$$\text{mode} = 76$$

- 6.) A class has exam scores that are normally distributed with a mean of 86 and a standard deviation of 3. Twenty-three of the students scored between 83 and 95. How many students took the exam?



- 7.) Nora wants to invest \$1400 into an account that has a 4.3% interest rate and the account is compounded continuously. How long will it take for the account to be \$3850?

$$3850 = 1400e^{0.043t}$$

$$2.75 = e^{0.043t}$$

$$\ln 2.75 = \frac{0.043t}{0.043}$$

$$t = 27.5 \text{ years}$$

- 8.) Given the piecewise function:

$$f(x) = \begin{cases} 2x+4 & \text{if } x \leq -2 \\ 3-x^2 & \text{if } x > -2 \end{cases}, \text{ find } f(6) + 2f(-4).$$

$$f(6) = 3 - (6)^2 = -33$$

$$f(-4) = 2(-4) + 4 = -4$$

$$-33 + 2(-4) = -41$$

- 9.) The table below shows the outstanding household credit market debt (in trillions of dollars) from 1998 through 2004. A linear model best models this data. What will be the debt in the year 2018?

Year	Household credit market debt, D (in trillions of dollars)
1998	6.0
1999	6.4
2000	7.0
2001	7.6
2002	8.4
2003	9.2
2004	10.3

$$y = 710714x - 1414.2564$$

$$x = 2018$$

$$y = ? \rightarrow$$

$$19.9 \text{ trillion}$$

- 10.) The table shows the numbers N of commercials banks in the U.S. from 1996 to 2005, where x = 6 for 1996. A logarithmic model best models this data. In what year will the number of banks drop to 5,300?

$$y = 13387.29022 - 2190.5231x$$

$$x = ?$$

$$y = 5300 \rightarrow$$

$$x = 40 \rightarrow$$

$$2030$$

Year	Number, N
1996	9527
1997	9143
1998	8774
1999	8580
2000	8315
2001	8079
2002	7888
2003	7770
2004	7630
2005	7540