A = the degree of the polynomial $3x^5y + 2^4x^3y^2 - 6x^8y^{-3}$

B = the choice which is not closed.   1) The Real numbers under addition
2) The rational numbers under multiplication
3) $\{-1, 0, 1\}$ under subtraction

C = the number beside the choice that is the name for a complex plane.
2) Cartesian Coordinate System
3) Argand Plane
6) Pascal's Triangle

Find $\dfrac{A \cdot B}{C}$

Given the equations $x^2 + y^2 = 8$ and $y = \dfrac{1}{2}x + 1$. Find the points of intersection.

A = the sum of the x's of the intersection.
B = the sum of the y's of the intersection.

C = the eccentricity of $x^2 + y^2 - 4x + 6y - 3 = 0$.

D = $x + y$ where (x, y) is the center of the ellipse $x^2 + 4y^2 + 6x - 8y + 9 = 0$

Find ABD + C

Two cubic containers of different sizes can hold a total combined volume of 35 cubic meters while the sum of two single edges of the containers is 5 meters. What is the volume of the larger of the two containers?

Each of the events, people, or objects is associated with a decade listed below. To find the decade, find the only real zero of the function. Then use the decades below (numbers 1 – 10 inclusive) to find $A \cdot F - (B + C) \cdot E + D$.

1) 1890-1899   **4)** 1920-1929   **8)** 1960-1969
2) 1900-1909   **5)** 1930-1939   **9)** 1970-1979
3) 1910-1919   **6)** 1940-1949   **10)** 1980-1989
                      7) 1950-1959

A) World War II ended : $f(x) = x^3 - 6x^2 + x - 6$
B) Wright Brothers' first flight : $f(x) = x^3 - 2x^2 + x - 2$
C) Chicago World's Fair : $f(x) = x^3 - x^2 + 9x - 9$
D) United States Bicentennial : $f(x) = x^3 - 9x^2 + 3x - 27$
E) Compact Discs (CDs) : $f(x) = x^3 - 10x^2 + x - 10$
F) Shirley Temple : $f(x) = x^3 - x^2 - 12x - 40$

Given the function $f(x) = \dfrac{x^2 - 2x - 3}{x^2 + 2x - 15}$.

A = x + y, where (x, y) are the coordinates of the removable discontinuity.
B = the equation of the vertical asymptote, x = **B**.
C = the equation of the horizontal asymptote, y = **C**.

Find   A•B•C

Given the word **TALLAHASSEE.**   Find :

A = the number of permutations
B = the number of circular permutations
C = the number of arrangements that start with the letter "H" and have the letter "L" in the third position.
D = the number of distinguishable permutations.

Find $\dfrac{A}{B+C+D}$ to the nearest hundredth.

There are 195 members in the Oshkosh Dog Club. Of these people, 79 own poodles, 87 own boxers, 68 own Irish Setters, 30 own both poodles and boxers, 28 own boxers and Irish Setters, 23 own poodles and Irish Setters, and 12 own all three types of dogs. How many members do not own any of these three breeds of dogs?

$231_6 = \mathbf{A}_8$

$\mathbf{2004 = B_5}$

$$\mathbf{C} = \sum_{x=1}^{20}(2x - 3)$$

Find   A + B + C

The air resistance on a streamlined object moving through the air is given by $R = CAV^2$ where R = air resistance, $C = 0.0004$, A = front area of the object, and V = the velocity of the object. The air resistance on object X, moving at 24 meters per second through the air, is 0.38 units of resistance. Find **A,** the front area of object X rounded to the nearest hundredth.

The population, **B**, in billions of the world is projected to follow the equation : $\mathbf{B} = \dfrac{11.14}{1+1.101e^{-0.051t}}$ by

the Population Reference Bureau, where $t = 0$ represents the year 1990. If this model is accurate, what is the maximum world population? Let **B** be this answer not converted to billions. (For instance, if you get B = 2, your answer is 2, not 2,000,000,000.)

Find A – B

Nick and Kevin are volunteering at the Children's Hospital. The probability Nick will catch a cold is $P(N) = 0.16$ while the probability Kevin will catch a cold is $P(K) = 0.21$. Do not round any of your answers to parts A-E below nor to the final answer.

A = The probability Nick will not catch a cold.
B = The probability Kevin will not catch a cold.
C = The probability that Nick and Kevin both will not catch colds.
D = The probability at least one of them will catch a cold.
E = Both Nick and Kevin catch colds.

Find $\dfrac{A+B+E}{C+D}$

Question #11
Theta Bowl 2004

Lauren wants to place decorative brick edging around a flower garden that is in the shape of a rhombus. One diagonal is 12 feet long, and the area is 264 square feet. How much brick edging must Lauren buy? Round up to the least whole number greater than your answer.

Question #12
Theta Bowl 2004

NOTE : For all parts of this problem, assume there are neither further deposits nor withdrawals. Round all answers to the nearest penny, including your final answer.

Miriam, Sapphire, and Denise were all grandchildren of their wonderful, though late grandfather Anthony. Each was left an inheritance of $5000 by their grandfather.

Miriam invested her money in the Mouse Ears Bank, which gave her 6% simple interest.
Let **M =** the amount of money Miriam had in her account after 5 years.

Sapphire invested her money in the Goofy Bank, which gave her 5.5% interest compounded quarterly. Let **S =** the amount of money Sapphire had in her account after 5 years.

Denise invested her money in the Pooh Bear Bank, which gave her 5% interest compounded continuously. Let **D =** the amount of money Denise had in her account after 5 years.

Now, sort **M, S,** and **D** from largest to smallest. Your answer is the <u>range</u> of this data.

Question #13
Theta Bowl 2004

Kayla goes to the highest point in the state of Florida, Mount Dora, which is 345 feet above sea level. Inspired, Kayla throws a super ball off the "mount". The ball falls down to sea level, bounces back up to 80% of its previous height, falls back to sea level, and then continues the same process. Round all answers to the nearest whole foot.

A = distance in feet the ball traveled vertically between the 1st and 2nd bounces.
B = distance in feet the ball traveled vertically between the 1st and 6th bounces inclusive.
C = distance in feet the ball traveled vertically before coming to rest.

Find A + B + C

Find x in each equation..

A. $\log_2 1024 = x$

C. $\log_x 125 = \dfrac{3}{4}$

B. $\log_x 125 = -3$

D. $\log_4 x = -\dfrac{1}{2}$

Find A•B•C•D

A. Rationalize and simplify. $\dfrac{6}{\sqrt[5]{64}}$ **A** = the denominator after you rationalize.

B. Simplify. $\sqrt[4]{8} \div \sqrt[6]{16} \cdot \sqrt[12]{128}$ **B** = the fractional exponent of 2 after you simplify.

Find   A•B