

Question #1- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

When doing research on the Florida Scrub Jay, the following information was recorded about the clutch size of 25 pairs of birds. (Clutch size is the number of eggs laid)

	<u>PAIR #</u>	<u>SIZE of Clutch</u>
1 through 5	3	
6 through 11	4	
12 through 15	5	
16 through 19	2	
20 through 22	3	
23 through 25	4	

Find $\frac{A}{B} - CD$ if

A = the average clutch size for the Florida Scrub Jay during this year.

B = the mode of the data shown

C = the range of the data shown

D = the median of the data shown

Question #2- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

A sea turtle buries 200 eggs in the sand. After the baby turtles hatch and dig to the surface, they scramble to make it to the relative safety of the ocean. Birds and other predators make the journey tough for the babies. Of the 176 babies hatched, 125 were eaten by birds, and 39 were eaten by other predators. The rest made it to the ocean. Suppose that just after the eggs were laid, you marked one with an "X". What is the probability that your egg was hatched and then your baby turtle made it to the ocean?

Question #3- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

Find $\frac{AB}{C+D}$.

Given:

A = the number of right angles in a rectangle

B = the number of degrees in a circle

C = (the number of obtuse angles in an obtuse triangle) minus
(the number of right angles in a right triangle)

$$D = \frac{(359 + 1)}{12001}$$

Question #4- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

When in flight small birds flap their wings more often than large birds. The number of times per second, n , that a bird flaps its wings during normal flight can be modeled by $nw = 6^3$, where w is the wing length in centimeters. The bee hummingbird has a wing length of about 3.5 centimeters, while the Ring-Billed gull has a wing length of about 55 centimeters. Find the ratio, in simplified form of the number of times a bee hummingbird flaps its wings to the number of times a Ring-Billed gull flaps its wings in a second.

Question #5- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

Porcupine fish, members of the puffer fish family, range between 5 and 20 inches in length. When in danger, the body of the fish puffs up by taking in water or air. (The tail, which is about 3" long, does not puff up.) The

volume of a "puffed-up" fish can be modeled by $V = \left(\frac{1}{6}\right)\pi(x-3)^3$ where x is the total length of the fish

in inches. Find the volume of an 11-inch porcupine fish and subtract the volume of a 6-inch fish.

Question #6- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

During the breeding season, a male elephant seal lost 38% of his weight. His weight, w (in hundreds of pounds), at the beginning of the season was a solution of $w^2 - 38w + 361 = 0$. How many pounds did he weigh at the end of the season?

Question #7- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

Find $2x^2 - 8x + x^3$, given that $3 + x = 4 - x$

Question #8- Algebra One TAMPA BAY TECH Invitational – March 31, 2001

The Florida Scrub Jays' average home territory is 1,000,000 square meters. This amount is equal to 10 hectares. The gray fox has home range of approximately 1620000 square meters. How many hectares is this?

Question #13-Algebra One TAMPA BAY TECH Invitational – March 31, 2001

Ribosomes are composed of different types of proteins and RNA (ribonucleic acid).

A typical cell of a mammal contains about 10×10^7 ribosomes. The volume of a ribosome is about 2.5×10^{-17} cubic centimeters. What is the minimum volume, in cubic centimeters, of a typical mammal cell? Express answer in scientific notation.

Question #14-Algebra One TAMPA BAY TECH Invitational – March 31, 2001

The following TWO equations can be used to find the approximate human age, $f(x)$, that corresponds to a dog's age, x .

For $0.5 < x < 5.5$: $f(x) = 10\sqrt{3x-1}$

For $x \geq 5.5$ $f(x) = 25\sqrt{x-3}$

Find $AC + B$ if:

A = the human age of a one year old dog

B = the human age of a twelve year old dog

C = the human age of a nine year old dog

Question #11-Algebra One TAMPA BAY TECH Invitational – March 31, 2001

As scuba divers descend, the pressure of the water increases. Scuba divers can determine their depth by the pressure. (Although depth gauges are much more reliable) Pressure can be expressed in atmospheres. An atmosphere is equivalent to 14.7 psi (pounds per square inch) of pressure. The chart below shows the linear relationship between atmospheres of pressure and ocean depth.

Pressure (atmospheres)	1	2	3	4
Depth of Ocean (feet)	0	33	66	99

Find the pressure on a diver if the depth is 198 feet.

Question #12-Algebra One TAMPA BAY TECH Invitational – March 31, 2001

Find $\frac{(A)(B^{-1})}{C}$

If:

A = the distance from point P(1,2) to point Q(5,5)

B = x, if the line between points R(3x, 4) and S(2,2) has a slope of 4

C = the slope of the line perpendicular to the line in B

Question #9-Algebra One TAMPA BAY TECH Invitational – March 31, 2001

Determine if the statement is True or False. If it is True, it has a value of 1 and if it is False it has a value of 2

- A. Every integer is positive or negative
- B. The absolute value of a negative number is positive
- C. The expression $-a$ is always negative
- D. If a is negative and b is positive then $a < b$
- E. If a and b are real numbers, then either $a < b$ or $a > b$

Evaluate $A + B + C + D + E$

Question #10-Algebra One TAMPA BAY TECH Invitational – March 31, 2001

If $n = 74$, find $(n-1)(n-2)(n-3)\dots(n-2001)$

Question #15-Algebra One TAMPA BAY TECH Invitational – March 31, 2001

Fourteen is twenty-five percent of A.

Thirty percent of seventy is B.

One hundred thirty-five is C percent of twenty-seven.

Find $\frac{ABC}{10,000}$