1. D; Cancel out the numerators and denominators that are the same and you are left with 1/100.
2. C;
3. C; x-coordinate of vertex is which equals 1, plug 1 into the equation and the y-coordinate (maximum physical ability) is 5.
4. D; multiply 3.5 tons by 2000 to convert to tons, set up the equation where = the weight of Columbia in pounds, and solve for . Then, add Columbia’s weight (158,315 lbs) to Atlantis’s weight to get 309,630 pounds.
5. B; you can use any two of the points in the graph to get the slope. Ex/ Take the points (5, 24) and (3,15). The slope = or . So, the slope of Dr. Prosper’s rocket = = .
6. C; Distributing, we get y – 11 = (5/2)x – (5/2)f which transforms to 5x – 2y = -22 + 5f. -22 + 5f = 3 🡪 f = 5.
7. E; Astronaut Cynthia’s salary is given by the expression , where some constant. Setting this equal to her salary of $100,000, we solve for , which equals 80,000. Joanna’s salary is given by the expression , and plugging in 80,000 for gives you a salary of $80,000.
8. B; This is a system of equations with two variables and two unknowns. We can multiply the second equation by -6 and add this to the first equation to eliminate the term. Then, we can solve for , which is 1. Plug 1 back into either equation to get the value, which also equals 1.
9. D; The total number of photos taken in one Martian year is , and the total number of photos taken in 688 days is . Therefore, on the 688th day, photos must have been taken.
10. D; Multiply the two probabilities together () to obtain the probability that both events will happen.
11. B; To rationalize the fraction, multiply it by . .
12. A; This expression expands to The coefficient of the term is therefore -12.
13. A; the sum of the roots can be found using the formula , where the quadratic equation is in the form . Using the given equation, you get
14. E; Albert’s height converted to inches is inches. Since he grows 3% taller, you must multiply his height by 1.03 to get 43.26 inches.
15. A; First, multiply the entire inequality by -1 and do not forget to flip the signs. This will give you . Then, subtract 5 from the entire inequality. This gives you or Thus, the lowest age was 28 and the highest age was 77. Adding this together gives you 105.
16. B; Setting up a Venn Diagram should give you this :

Therefore, 31 civilians visited Saturn only.

S

31

23

41

J

1. A; The square root of a number less than one is going to be greater than that number. Ex: square root of 0.16 is 0.4. When a number less than one is squared, the result is less than that number. When 1/.9999 is greater than 1, as well
2. C; 35+2x = 25+3x

x=10

1. C; The SpaceX rocket travels x2 billion miles and the NASA rocket travels 144 billion miles. , , and NASA travels for 2x hours, so the answer is 288.
2. B; Since Bowl A is 20% Gobeldy Goop and Bowl B is 30% Gobeldy Goop, the professor will need equal amounts to produce a mixture that is 25% Gobeldy Goop. So, he needs 10 ounces of each.
3. A; Square root is equivalent to the exponent 
4. A; In one hour, one pump fills ⅕ of the tank, one fills 1/12 of the tank, and the hole empties 1/15 of a tank in one hour. Add to get 13/60. This means that in one hour, 13/60 of the tank is filled. Therefore, in 60/13 hours, which rounds to 5, the tank will be full.
5. D; Definition of a function
6. D; Factor out into , meaning the x values are -6 and 3 when y is 0.
7. B; 0.is 4/9. This can be figured out by setting and . Subtract to get . 2.25 in fraction form is 9/4. Multiply to get 1.
8. C; Multiply the first equation by two, getting Plug in the value for to the original equations to get
9. B; Use the Midpoint Formula. x = = 3, y = = 4
10. A; The numbers all add up to 40. The smallest numbers are 1,2,3,4, leaving 30 as the largest possible number.
11. C; You can look at the problem this way. If the spacesuit costs $100, take off 30% first, so the cost is now $70. Then, take off an additional 20%, leaving $56. So, the new cost is 56% of the original price.
12. A: Albert II