**Choose the letter of the correct answer. In all cases, E) NOTA means “none of these answers”.**

1. What is ?

**A) 1 B)  C)  D)  E) NOTA**

1. 306 men and 49 women have flown aboard NASA’s space shuttles. What percentage of those who have flown are women?

**A) 1.38 B) 1.60 C) 13.8 D) 16.0 E) NOTA**

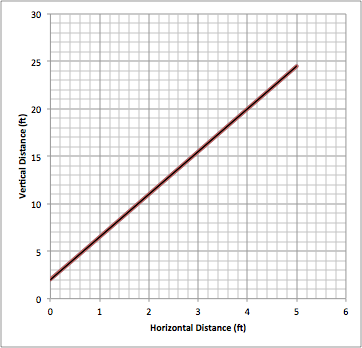
1. **A**ndrea aspires to be an astronaut one day, and in order to do so, must train to reach the peak of her physical health. Only when she is at that maximum can she go into space. A graph of her physical ability over time is in the shape of a parabola with equation

y = -x2 + 2x + 4 (where y = physical ability and x = time). What is the maximum value of her physical ability?

**A) 1 B) 3 C) 5 D) 7 E) NOTA**

1. The launch of Atlantis marked NASA’s 135th mission and final flight for the Space Shuttle Program. Weighing 151,315 pounds when it rolled out of the assembly plant in California, it was 3.5 tons lighter than Columbia, a space shuttle built prior to Atlantis. What is the combined weight of Columbia and Atlantis in pounds? (Hint: 1 ton = 2000 lbs)

**A) 7000 B) 144,315 C) 158,315 D) 309,630 E) NOTA**



1. Dr. Prosper is working on launching a rocket that follows the path of the **l**ine shown on the graph above. What is the slope of this rocket’s path?

**A) B) C) 5 D) E) NOTA**

1. If the equation of the path of a rocket (not the one in #5 ) in point-slope form is  and in standard form is 5x – 2y = 3, find the value of *f* .

**A) -11 B) -5 C) 5 D) 11 E) NOTA**

1. Suppose that the average astronaut makes a salary that is directly proportional to his or her number of years of experience and inversely proportional to his or her number of simulation errors. Astronaut Cynthia has 5 years of experience, 4 simulation errors, and makes $100000. Astronaut Joanna the astronaut has 2 years of experience and 2 simulation errors. What is her salary?

**A) $50,000 B) $100,000 C) $160,000**

**D) Cannot be determined E) NOTA**

1. NASA is developing a first-ever ro**b**otic mission to visit a large near-Earth asteroid, collect a multi-ton boulder from its surface, and redirect it into a stable orbit around the moon. If the path of the asteroid is given by the equation , and the path of the robot is given by the equation , at which point will the robot be able to meet the asteroid and collect the boulder?

**A) (-1, ) B) (1, 1) C) (1, 2) D) (-, ) E) NOTA**

1. The Curiosity rover landed on Mars on August 6, 2012, and on June 24, 2014, it completed one Martian year on the planet (687 Earth days). Suppose that the average number of pictures taken per day over the course of the Martian year is 20. If the average becomes 21 pictures per day on the rover’s 688th day on the planet, how many photos were taken on the 688th day?

**A) 21 B) 667 C) 687 D) 708 E) NOTA**

1. Astronauts Jessica and Ashley are on a space shuttle heading towards the moon. The probability that they will reach the moon is , and the probability that it will land successfully is. What is the probability that the rocket will reach the planet and land successfully?

**A) B) C) D) E) NOTA**

1. Sometimes Astronaut K**e**vin gets bored at the International Space Station while waiting on his microgravity experiment and decides to rationalize some fractions. Help him rationalize .

**A) B) C) D) E) NOTA**

1. NASA’s goal is to explore the ever-expanding universe. Speaking of expansions, what is the coefficient of the term in the expansion of ?

**A) -12 B) 0 C) 4 D) 9 E) NOTA**

1. Once Jamie has been selected as an astronaut candidate, she must complete two years of training in order to become an astronaut. In her math class, Jamie is told to find the sum of the roots for the equation . Please help her out?

**A) -32 B) -16 C) -8 D) 0 E) NOTA**

1. Astronauts actually grow to become 3% taller while being in space. If Albert II, the first monkey to reach space began on earth at a height of 3 ft. 6 in and he goes into space, how tall is he now in inches?

**A) 40.74 B) 1.26 C) 54.6 D) 126 E) NOTA**

1. The range of ages of people who have been in space is given by the inequality

. Solve this inequality to find the sum of the ages of the youngest and oldest people in space.

**A) 105 B) 110 C) 120 D) 125 E) NOTA**

1. Imagine a future where NASA is able to send civilians to visit Jupite**r** and Saturn to conduct scientific research. Civilians can visit more than one planet, and each civilian sent into space visited at least one planet. The spaceship Deng-Jin took some number of civilians to the two planets. Twenty-three civilians visited both planets, 64 visited Jupiter, and 54 visited Saturn. How many civilians visited only Saturn (but not Jupiter)?

**A) 23 B) 31 C) 41 D) 95 E) NOTA**

1. Odessa’s satellite travels in a circular orbit around the Earth with a radius of 0.9999 km. If Alanna’s satellite has a smaller orbit, which of the following could be the radius of her satellite’s orbit?

**A) II only B) I, III C) I, II D) I, II, III E) NOTA**

1. Joanna the Astronaut thinks she is better than Cynthia the Astronaut because Joanna has 10 more space gadgets than her. Cynthia wants to prove that she can be just as good as Joanna by making 3 space gadgets per hour, while Joanna only makes 2 space gadgets per hour. If Joanna has 35 space gadgets, how many hours will it take for Cynthia to have equal the amount of Joanna’s gadgets?

**A) 2 B) 5 C) 10 D) 25 E) NOTA**

19. A SpaceX rocket travels for hours, at billion miles per hour while NASA’s rocket travels for 2 hours at 72 billion miles per hour. If the **t**wo rockets traveled the same distance, how many hours did NASA’s rocket travel?

**A) 36 B) 144 C) 288 D) 576 E) NOTA**

20. NASA has sent you to Uranus and you have found a strange new substance called Gobledy Goop! Professor Gan mixes the Gobledy Goop with water in two ways. Bowl A is 20% Gobledy Goop and 80% water while Bowl B is 30% Gobledy Goop and 70% water. The professor places some of the contents from Bowl A and some contents of Bowl B into Bowl C to make a mixture of 20 ounces that is 25% Gobledy Goop. How many ounces of the Bowl A mixture did he pour into Bowl C to accomplish his goal?

**A) 5 B) 10 C) 15 D) 20 E) NOTA**

21. Write  as an exponential function.

**A) B) C) D) E) NOTA**

22. An oxygen tank is being filled by two pumps. One pump can fill the tank in 5 hours while the other can fill the tank in 1**2** hours. However, this tank is very old and has a small puncture that completely empties a full tank of oxygen in 15 hours. If both fill pumps are functioning, how many hours, rounded to the nearest whole number, will it take to completely fill the tank?

**A) 5 B) 7 C) 10 D) 15 E) NOTA**

23. In order to become a part of NASA, every member needed to solve this funky function:

f(f(f(f(0)))), given

|  |  |
| --- | --- |
| f(x) | x |
| 5 | 3/2 |
| 12 | 0.78 |
| 3/2 | 0 |
| 0.78 | 5 |

**A) 0 B)  C) 0.78 D) 12 E) NOTA**

24. In this scenario, outer space will be modeled on a two-dimensional Cartesian plane. Jessica is looking for aliens in space in her rocket. It has been proven that aliens are found all along the x-axis. If Jessica’s path is modeled by , what is the product of the x values at which she will find aliens?

**A) 3 B) 18 C) -3 D) -18 E) NOTA**

25. The Millennium Falcon is travelling at 0.444… light years per hour for 2.25 hours, how many light years does it travel?

**A) Undefined B) 1 C) 10 D) 25 E)NOTA**

26. You decide to take a trip to the NASA gift store. Seven bags of astronaut ice cream and 2 t-shirts cost $40. Four bags of astronaut ice cream and 4 t-shirts cost $60. How much does 2 bags of astronaut ice cream and one t-shirt cost?

**A) 5 B) 12 C) 17 D) 19 E) NOTA**

27. If Star Uno is located at (-1, 1) and Star Dos is located at (7, 7), and Star Tres is located halfway between Uno and Dos, what are the coordinates for Star Tres?

**A) (2, 5) B) (3, 4) C) (4, 3) D) (5, 2) E) NOTA**

28. The average of a set of 5 distinct positive integers is 8. What is the largest possible number that could be included in this set?

**A) 30 B) 21 C) 15 D) 8 E) NOTA**

29. Alanna the astronaut wants to buy a trendy spacesuit. The space-clothing store is having a 30% off sale storewide. There is an additional 20% off sale on spacesuits after the original 30% is taken off. What percent of the original price did Alanna spend on the spacesuit?

**A) 10% B) 50% C) 56% D) 60% E) NOTA**

30. What was the name of the first monkey to be sent successfully into space? (Hint: the answer is in the test)

**A) Albert II B) Bongo III C) Richie D) Danny the Ape E) NOTA**