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

1. Welcome to the end of the Cretaceous period! It was now when all of the dinosaurs went extinct after inhabiting Earth for 165 million years. What is the largest prime factor of 165?

**A.  1         B.  5         C.  11        D. 33          E. NOTA**

2.  Ben, a caveman, was out looking for his dinner when he came across 20 rabbits in a meadow. He captures 2/5 of them when suddenly, a fox comes out and eats 3/4 of the remaining rabbits. How many rabbits are left in the meadow?

**A.  4         B.  5         C.  6        D. 7          E. NOTA**

3.   Archaeologist Kaitlyn discovered a set of bones that belonged to the pterodactyl. It had an enormous wingspan, almost 12ft tip to tip! Kaitlyn noticed that the bones of the wing formed the shape of a triangle and she measured the side lengths to be 6ft, 6ft, and 3ft. What is half of the perimeter of the triangle?

**A.  3 ft        B.  7.5 ft         C.  15 ft        D. 36 ft          E. NOTA**

4.  After the Cretaceous period came the Cenozoic Period (the period we are in now). How many ways are there to arrange the letters in the word Cenozoic?

(Hint: The number of ways to arrange the letters in a word with n letters can be found through n!, called ’n factorial’. N! is the product of all positive integers less than or equal to n. If a letter is repeated more than once in a word, we divide n! by the factorial of the number of occurrences of the repeated letter.)

**A.  64         B.  10080        C.  20160        D. 40320          E. NOTA**

5.  Vera was sleeping under the shining stars when she noticed a light flickering in the distance. Being the curious Neanderthal she is, Vera started walking towards it. Assume Vera is on a coordinate plane and is at the point (0,0). If she walks 5 units west then 3 units south and finally 8 units east to arrive at the light source (a burning fire), what point will she arrive at?

**A**.  **(-3,3)                B. (5,11)              C. (3,-3)               D. (11,5)               E. NOTA**

6.  After the extinction of dinosaurs, plants and small animals quickly repopulated Earth. In fact, there was a spurt in the growth of ferns, distributed in many environments. The repopulation of ferns can be modeled by the algebraic equation p = 10t + 2300, where p is the population of ferns and t is the time (in thousands of years) after the extinction of dinosaurs. What is the population of ferns 3000 years after the extinction of dinosaurs?

**A.     2400        B.    2310       C. 3300       D.    5300       E. NOTA**

7.  1000 years after the extinction of the dinosaurs, small rodents of mass 600 grams roamed the Earth. 100,000 years after the extinction of the dinosaurs, the rodents became the size of raccoons, approximately weighing 1.8 kgs. 10 million years after the extinction of the dinosaurs, the rodents had a mass of 5.4 kgs. What will be the mass, in kgs, of the rodents 1 billion years after the extinction of the dinosaurs if this pattern continues?

**A.   6.6                    B.      9.0              C.   10.4                D.      16.2               E. NOTA**

8.  One of the most common theories for the extinction of the Earth was an impact by a very large asteroid measuring more than 6 miles across, and having a mass of 846 units. Given that the momentum of an object is given by MASS x VELOCTIY, what was the velocity of the asteroid if it landed with 12,345,678 units of momentum?

**A. 12,345             B. 14,593           C. 18,624         D. 90,210            E. NOTA**

9.  Chloe the prehistoric shark swims 40 miles (roundtrip) every day before returning back to the same spot at sundown. Assume Chole can tell time by the position of the sun. If she starts swimming her 40 miles at sunrise (6:34 am) and returns back at sundown (8:27 pm), for how long does Chloe swim everyday?

**A. 2 hours and 7 minutes          B. 13 hours and 53 minutes          C. 14 hours and 7**

**minutes          D. 24 hours and 53 min         E. NOTA**

10.  At the zoo, Bryan saw a massive alligator named Jim. Bryan read on a nearby display board that alligators are a relative of the dinosaurs and are notorious for losing their teeth! If Jim loses his teeth at a rate of 1 tooth every 14 days and regrows his teeth at a rate of 1 tooth every five days, and has 73 teeth in his mouth in the start, how many years will it take Jim to get a brand new set of teeth (round to the nearest year)? Assume that the tooth replacement process occurs one tooth at a time, for example one tooth will be lost and regrown before another tooth is lost, (Jim has a minimum of 72 teeth in his mouth at any given time and has 73 teeth when all his teeth are fixed).

**A.       2              B.      3              C.      4              D.       7              E. NOTA**

11.  Some of the most common living relatives of the dinosaurs are birds. Assume there are approximately 10,000 birds living on Earth, 60 of which cannot fly. Of the flightless birds, 25% of them are classified as large birds. What is the ratio of the number of flightless large birds to the number of birds that can fly?

**A.     3:2000       B.      3:1988         C.      3:500        D.  3:497          E. NOTA**

12.  Lindsay the ornithologist (a person who studies birds) was observing a rather large ostrich in an aviary. Lindsay noticed that this ostrich was special as all of its feathers were different sizes. She quickly jotted down the lengths of seven of the bird’s feathers as shown:

7 ft 42 in 3 yards 30 in 20ft 96 in 2 yards

What is the mean length of the ostrich’s feathers in feet?

**A.      8ft             B.      12ft           C. 36ft              D.      200ft            E. NOTA**

13.  At Jurassic World, humans recreated the dinosaurs. Surabhi visited Jurassic World and had to convert her US dollars to Worldsies, the currency of Jurassic World. One US dollar is worth eight Worldsies. Surabhi spent 52 Worldsies at Jurassic World and then went to visit Skull Island where their currency is Skullies. At Skull Island, Surabhi converted her Worldsies to Skullies, where the conversion rate is 4 Worldsies to one Skullies. She spends 8 Skullies on Skull Island, and returns home where she converts all of her Skullies back to US dollars. If Surabhi started with 100 dollars, how much money does she have left in US dollars?

**A.      $79.00         B.      $89.50       C.     $93.50       D.       $95.00       E.  NOTA**

14.  Jessica, a cave person, does a math question every day in order to keep her mind sharp. Jessica is having trouble with today's question. Simplify the following expression and help Jessica out!

**(10 x 15 + 40 - 8 ÷ 4) - ([23 - 45 + 4] ÷ 2 )**

**A.      54.5            B.       179            C.      197             D.      201           E. NOTA**

15. Paleontologists learn a lot about dinosaurs from their footprints, including their speed and size. One such study by Dr. Donald Henderson showed that the height of a dinosaur can be approximated to be 4 times the length of their footprint (from the bottom of the semi-circle to the very top of the middle peak). Assume Dr. Henderson comes across the following vertically symmetrical footprint composed of semi-circles, rectangles and triangles. The semicircle has a radius of 9ft, the two side toes have an area of 27ft2 with a base length of 6ft, the rectangle composing the base of the middle toe has an area of 54ft2, and the triangle composing the top of the middle toe has an area of 15ft2. A diagram of the footprint can be seen below.

6 ft

9 ft

6 ft

27 ft2

15 ft2

54 ft2

What is the approximate height of the dinosaur?

**A. 14ft             B.      23ft          C.  56ft           D.    92ft            E. NOTA**

16.  Alex and Jason are playing a fossilized dinosaur egg tossing game where they take turns trying to land the dinosaur egg into a perfectly circular basket. If Alex throws the egg 8m in front of him and Jason throws the egg 12m in front of him, what is the minimum radius of the basket so that both Alex and Jason’s eggs land in the basket? Assume both Alex and Jason throw the egg from the same position at the same height in a straight line in front of them.

**A.  2     B.   4      C.  8      D. 20       E.  NOTA**

17.  One day, Cyrus is swimming in the beach when a megalodon (the largest shark to ever exist) comes up from the great depth of the ocean looking for a friend. Cyrus tells the megalodon that he will be his friend only if the shark tells him his age. He gives the shark the following hint:

My guardian’s age is 3 times my age now, in 30 years my age will be 60% of my guardian’s age.

Help the Megalodon make a new friend! what is Cyrus’s age?

**A.  15     B.   30      C.  45    D. 75      E.  NOTA**

18.  Josh is foraging for fruits and berries to bring back to his family for dinner. As he gathers his berries, he spots butterflies flying around and decides to capture them with his homemade net (a bag) to show his family. Josh catches 1 butterfly in the first minute, 2 in the second minute, 4 in the third and so on. How many butterflies has he caught after 7 minutes?

**A. 64               B. 96           C.      127        D. 255              E. NOTA**

19.  Wesley the cave person wants to make a cool new cave painting in his new cave. In order to do this, he needs to create pigment using berries from a nearby tree. There are 112 identical looking berries on the tree, and they all contain different color pigments inside. If 1/4 of the berries contain red pigment, 1/7 of them contain black pigment, 1/14 contain blue pigment, and the rest of the berries contain green pigment. What is the minimum number of berries Wesley needs to select in order to have at least one berry with a pigment of each color?

**A.    4           B.   44          C.   68          D.   104              E.  NOTA**

20.  After the dinosaurs went extinct there was an ice age in which global temperatures dipped down to -10°C. What is -10 degrees Celsius in degrees Fahrenheit? Hint: The formula to convert degrees Celsius to Fahrenheit is °C = (°F- 32).

**A. -46°F     B.   -18°F      C. -14°F       D. 14°F   E. NOTA**

**Use this information for questions 21-23**

Brighten and Rahul are looking for fossils in a glacier. However, the glacier starts to melt! The glacier is a rectangular prism with bases of length 6m and 7m and a height of 9m. The glacier melts and reforms at uniform rates, melting 45m3 per minute, and reforming 48m3 per two minutes.

21.  Assuming only ⅔ of the glacier is above water, and the water is parallel to the base of the rectangular prism, what is the current surface area of the glacier that is exposed in meters squared? Hint: Imagine cutting the rectangular prism at a certain section.

**A.    198 m2      B.   212  m2  C.  240 m2    D.  252 m2    E. NOTA**

22.  How many more minutes can Brighten and Rahul stay on the glacier until it is completely melted? Disregard whether the glacier is above or below water.

**A.   2 minutes  B. 18 minutes  C. 21 minutes   D. It will never melt     E.  NOTA**

23.  Brighten and Rahul quicken their pace to get the most fossils out of the glacier. If Brighten can find 1 fossil in 5 minutes and Rahul can find 7 fossils in 21 minutes, how long does it take them to find 16 fossils? Round to the nearest minute.

**A. 2 minutes    B. 30 minutes   C. 48 minutes    D.  128 minutes    E.  NOTA**

24.  Filippo is on an expedition when he finds ancient ruins with an interesting inscription on it. The inscription seems to be a number in Roman numerals! Help Filippo understand the inscription seen below and convert the Roman numerals to a base-10 number.

**MMXXI**

**A. 1979     B. 1980       C. 2020       D. 2021   E.  NOTA**

25.  Tina is exploring Stonehenge, an ancient monument in England and notices an interesting pattern. Stonehenge has large and small rocks that alternate. The first stone has a height of 30ft, the second stone has a height of 26ft, the third stone has a height of 32ft, the fourth stone has a height of 24ft and so on. What is the sum of the heights of the fifth, sixth, and seventh stones in feet?

**A.  56ft      B.   58ft      C. 90ft     D.   92ft E.  NOTA**

26.  Sarah, a woman living during the Cretaceous period, gathered 6 different plants to make a medicine. She had to have these medicines in a specific order so that the concoction worked. The 6 six plants she gathered were the Alnus, Aralia, Pandnus, Araucarioxylon, Podocarpus, and Palmus (yes these are real names). Use the following clues to determine the name of the plant Sarah added first to her medicine concoction.

The name of the plant will be constructed based on whether the statement is true or false

1. 0.333 > ⅓

if this statement is true: the plant name has a “d” in it

false: the plant name does not contain “d” in it

1. Pi is a rational number

if this statement is true: the plant name does not have a “u” in it

false: the plant name has a “u” in it

1. The first 10 integers (1-10 inclusive) contains 4 prime numbers

if this statement is true: the plant name starts with “A”

false: the plant name doesn't start with “A”

1. 0 is a whole number

if this statement is true: the plant name has a “s” in it

false: the plant name does not have an “s”

**A. Alnus     B. Araucarioxylon    C. Palmus   D. Podocarpus    E.  NOTA**

27.  Noah was looking at the stars one night when he noticed a trapezoid shaped constellation. He measured two angles of the trapezoid to be 45° and 135°. He also saw that the bases had lengths of 16 and 40, and he noted the height was 12. Noah loves math so, for fun, he decided to correctly calculate the product of the area of the trapezoid and the sum of the missing angles. What was Noah's answer?

16

(Hint: the area of a trapezoid is ½ x (base1 + base2) x height)

135°

12

45°

40

**A.    180      B. 672       C. 60480    D. 120960   E.  NOTA**

28.  Jack and Jill were having an argument on which dinosaur is better, the T-Rex or the Triceratops. Their brother, Jake, decided to settle the argument by giving them a math question. Jack and Jill’s work is shown below- who is correct, and what property of math did they implement?

**Question:**

5 (x +20) – 27 = 88

Solve for x

**Jack’s Answer:**

**x = 3**

**Jill’s Answer:**

**x = 45**

**A.  Jill, Commutative Property of Addition   B.  Jack, Distributive Property       C.  Jack, Inverse Property of Multiplication  D. Jill, Distributive Property E.  NOTA**

29. Elle is a dinosaur and plant fossil collector who came across an online deal! She buys 3 bones for $113.50 each and 4 plant fossils for $75.75 each. How much is her total bill rounded to the nearest hundred dollars (assume tax has not been added)?

**A. 643.5   B. 600    C. 640.50  D. 650   E.  NOTA**

30.  The dinosaurs have been extinct for 65 million years. What is the place value of the 6 in 65 million?

**A.  Ten Millionths    B. Hundred Thousandths C. Hundred Millionths   D. Millionths**

**ImageE.  NOTA**