PREALGEBRA – SOUTH AMERICA

Characters in this test are fictional. For information about raising alpacas, please visit www.flalpacas.com.
Choose the letter of the correct answer. "NOTA" means "none of these answers."

1) *Wenceslao is in sixth grade. He lives in Peru's capital, Lima.*
How many times can you multiply 6 by 6 before the product surpasses 66?

A) 1 **B) 2** **C) 3** **D) 4** **E) NOTA**

2) *Wenceslao went outside to pet his fluffy alpaca named Chopin.*
Chopin hummed with contentment at 50 decibels. How many integers are less than 50?

A) 48 **B) 49** **C) 50** **D) 51** **E) NOTA**

3) *"Chopin," Wenceslao said, "I'm glad we live in Lima. In 2008, they passed a one-dog rule but they didn't say anything about limiting alpacas!"*
I do not know if 1 is a prime number. Which of the numbers below are prime?

A) 0 **B) 1** **C) 111** **D) 181** **E) NOTA**

4) *Wenceslao left for the bus stop. He talked to himself. "Last night, my grandfather asked me, how many of South America's largest rivers empty into the Pacific Ocean?"*
The answer is equivalent to the expression $\frac{x^2-10x+25}{73}$, where $x = 5$. What is the answer?

A) 0 **B)** $\frac{25}{73}$ **C)** $\frac{50}{73}$ **D) 1** **E) NOTA**

5) *As Wenceslao boarded the bus, he thought more about his grandfather's conversation. His grandfather had said, "I'm going to tell you a story. Voy a contar un cuento para tí."*
If telling $\frac{1}{2}$ of a story takes 3 minutes, then how many minutes does it take to tell $\frac{20}{2}$ stories?

A) 10 **B) 20** **C) 60** **D) 120** **E) NOTA**

6) *Once, a group of Colombian herders were riding a canoe across the Amazon River, which Brazilian scientists claim is the longest river in the world.*
Which of these answers is closest to the longest possible integer length of a rectangle with a 25 inch perimeter?

A) 5 **B) 7** **C) 11** **D) 13** **E) NOTA**

7) *A man accidentally dropped his bola, a throwing weapon, into the water.*
If a spherical weight on a bola has a radius of 2 inches, what is the volume of the weight in cubic inches?

A) $\frac{16}{3}\pi$ **B)** 8π **C)** $\frac{32}{3}\boldsymbol{\pi}$ **D)** 32π **E) NOTA**

8) *But, the man was calm. Really calm.*
This man was 300 times calmer than his pre-algebra teacher. His pre-algebra teacher was 25 times calmer than Fred. How many times calmer was this man than Fred?

A) 7500 **B) 325** **C) 12** **D) $\frac{1}{12}$** **E) NOTA**

9) *The man took out a small knife, and marked the side of the canoe where he dropped the bola.*
The mark was in the shape of a triangle with a base of $\frac{1}{5}$ cm and a height of 5 cm. What is the area of this triangle in square cm ?

A) $\frac{1}{5}$ **B) $\frac{1}{2}$** **C) 1** **D) 5** **E) NOTA**

10) *Everyone else on the canoe asked urgently, "Why don't you quickly jump in the water to haul out your bola with the net?"*
If the probability of capturing the bola in one try is between $\frac{13}{43}$ and $\frac{21}{46}$, then which of these answers could be the probability of capturing the bola in one try?

A) $\frac{11}{39}$ **B) $\frac{16}{49}$** **C) $\frac{20}{41}$** **D) $\frac{23}{50}$** **E) NOTA**

11) *The man remained calm. He said, "The water in the middle of the river is so swift and dangerous."*
The depth of the river's middle is x meters, where $x^2 = 529$. What is the positive value of x?

A) 23 **B) 24** **C) 264.5** **D) 1058** **E) NOTA**

12) *"I will retrieve the bola when we arrive ashore. I've already marked where it fell," reasoned the man.*
On a Cartesian plane, the boat begins at (3, 4). Moving towards the shore, the boat moves more than 4 units away. Where can the boat be now?

A) (-1, 4) **B) (0, 8)** **C) (5, 6)** **D) (7, 4)** **E) NOTA**

13) *Everyone else laughed. Wenceslao and his grandfather chuckled, too.*
The mouth of a laugh is roughly shaped like a semicircle with area 8π cm^2. What is the radius of this semicircle in cm?

A) 4 **B) 4π** **C) $\frac{8\pi-2}{\pi}$** **D) $\frac{8\pi}{2+\pi}$** **E) NOTA**

14) *At one of the last stops before school, Jack got on the bus and sat next to Wenceslao. Jack was munching on roasted guinea pig, a popular food in Peru.*
The number of guinea pigs that Jack ate last year is equal to the cube root of 343 multiplied by the square root of 1. How many guinea pigs did Jack eat last year?

A) 3 **B) 4** **C) 7** **D) 114** **E) NOTA**

15) *"Jack," inquired Wenceslao, "does your grandfather ever tell you stories?"*
If 6 storybooks are lined up in one row, how many distinct ways can they be lined up?

A) 6 **B) 120** **C) 720** **D) 5040** **E) NOTA**

16) *"He has. I'll tell you one," answered Jack.*
Divide "x" by the number 0. This quotient will not be different from the value of "x." What is the value of "x"?

A) -1 **B) 0** **C) 1** **D) any number** **E) NOTA**

17) *Once, a lazy Ecuadorian farmer was looking at his field of maize.*
The number of days the farmer rested in the past decade is equal the next number in this sequence: 2, 22, 242…
How many days did the farmer rest in the past decade?

A) 11 **B) 484** **C) 2662** **D) 2882** **E) NOTA**

18) *The farmer had not watered his plants properly, so the maize was growing slowly.*
$\frac{24}{54}$ of the maize grows slowly and the rest grows sluggishly. Which of these percents is closest to the part of the maize that grows sluggishly?

A) 44% **B) 45%** **C) 55%** **D) 56%** **E) NOTA**

19) *All of the other farms had taller maize.*
The other maize is $y = \frac{1450(x^3-63)}{1000}$ times taller than the lazy farmer's maize, where $x = 4$. What is the value of y ?

A) 1.45 **B) 9.28** **C) 39.15** **D) 73.95** **E) NOTA**

20) *The farmer wanted to think of a quick way to grow his maize, without doing much work.*
Quickly! Which of the following pairs of numbers are relatively prime?

A) 3 and 9 **B) 14 and 31** **C) 56 and 105** **D) 11 and 132** **E) NOTA**

21) *The farmer decided to pull his maize further out of the ground. Now, his maize was taller!*
The farmer pulled up $3-(5-12)+[56+24(-1)]\left(\frac{1}{2}\right)$ stalks of maize. How many stalks of maize did the farmer pull up?

A) 12 **B) 26** **C) 68** **D) 74** **E) NOTA**

22) *That night, the farmer was content because he felt very smart.*
Before he fell asleep, the farmer counted 114 Argentinian llamas and 8 Bolivian llamas. What is the greatest common factor of 114 and 8?

A) 1 **B) 2** **C) 4** **D) 8** **E) NOTA**

23) *After dawn, the farmer smiled and confidently looked out his window at his maize.*
The glass in his window is shaped like a rectangular prism with F faces, V vertices, and E edges. What is the value of $(F+V-E)$?

A) 0 **B) 1** **C) 2** **D) 26** **E) NOTA**

24) *He gasped.*
80% of the lazy farmer's maize died overnight. What is the prime factorization of 80?

A) (2)(2)(2)(10)
B) (1)(2)(4)(10)
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25) *"Haha. Nice story," said Wenceslao.*
Wenceslao also thinks that square numbers are nice. How many positive perfect square numbers under 100 are also composite?

A) 7 **B) 8** **C) 9** **D) 10** **E) NOTA**

26) *Wenceslao thought out loud, "I'm glad I got to hear two stories in 12 hours."*
At this storytelling rate, how many stories can Wenceslao hear in one week?

A) 4 **B) 28** **C) 1168** **D) 4032** **E) NOTA**

27) *"Yeah," continued Jack. "But my grandfather also talks about soccer a lot. He's Brazilian; and he loves soccer."*
The center circle of a soccer field has a radius of $9.15\ m$. What is the circumference of a circle with a radius of $5.19\ m$?

A) $\boldsymbol{5.19\ m}$ **B)** $\boldsymbol{5.19^2\pi\ m}$ **C)** $\boldsymbol{10.38\pi\ m}$ **D)** $\boldsymbol{10.38\pi^2\ m}$
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28) *"My dad told me about a Brazilian city called Curitiba!" exclaimed Wenceslao. "He said that their bus system is so good that every day, over 80% of the travelers use it."*
Which of the following fractions is equal to 0.80 or 80%?

A) $\frac{10}{11}$ **B)** $\frac{17}{19}$ **C)** $\sqrt{\frac{16}{25}}$ **D)** $\sqrt{\frac{25}{36}}$ **E) NOTA**

29) *Jack nodded, "That makes sense. Jaime Lerner is an urban planner who helped design the bus system. He was the mayor of Curitiba from 1971-75, 1979-84, and 1989-92."*
Which of these numbers is irrational?

A) $\sqrt{1}$ **B)** $\sqrt{4}$ **C)** $\sqrt{5}$ **D)** $\sqrt{9}$ **E) NOTA**

30) *Jack and Wenceslao walked into the school, and entered their math class. They sat down to take a test. The first question said, "Pretend you are in 6th grade. You live in Tallahassee, FL."*
On the Cartesian plane, what happens to the equation $y = -40x - 6$ after you multiply both sides by 6 ?

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