2006 Pizitz Mathematics Tournament
Seventh Grade Test

1. Find 0.462462… as a simplified fraction.

A. $\frac{154}{333}$ B. $\frac{231}{500}$ C. $\frac{77}{222}$ D. $\frac{7}{15}$ E. NOTA

2. How many positive prime numbers are less than 75?

A. 19 B. 20 C. 21 D. 22 E. NOTA

3. Evaluate $x^3 + 4x^2y + 4y^2x + y^3$, if x = -1 and y = 2.

A. -17 B. -1 C. 13 D. 23 E. NOTA

4. How many ways can you arrange the letters in ADARSH?

A. 360 B. 72 C. 2520 D. 720 E. NOTA

5. Solve the system of equations for y:

$$\begin{aligned} 3x + 5y &= 19 \\ x - 2y &= -1 \end{aligned}$$

A. 5 B. -16 C. 3 D. 2 E. NOTA

6. What is 30% of 65% of 240?

A. 34.8 B. 46.8 C. 48 D. 43.2 E. NOTA

7. Find the slope of the line that is perpendicular to the line that goes through the points (-2,4) and (2, -2).

A. $^2/_3$ B. $^3/_2$ C. $-\,^2/_3$ D. $-\,^3/_2$ E. NOTA

8. It takes Owen 3 hours to work a math problem alone. It takes Valentina 4 hours to work the same problem alone. How many hours does it take for them to finish the problem together?

A. $^{12}/_7$ B. 3.5 C. 2 D. $^7/_6$ E. NOTA

9. Simplify $a(a^3 – 24) – a^2(8 - a) + 3a (3a + 12) + 20a$

A. $a^4 – a^3 – 8a^2 + 41a$ C. $a^4 + a^3 + a^2 + 32a$

B. $a^4 + a^2 + 33a$ D. $a^4 + a^3 – 8a^2 – 89a$ E. NOTA

10. Find the number of positive integral divisors of 440.

A. 8 B. 12 C. 14 D. 16 E. NOTA

11. Find $a^b + b^c + c^a$ if: a = the number of positive factors 120 has,

b = the absolute value of the sum of the first five negative integers, less fourteen,

c = the GCF of 41 and 711.

A. 17 B. 10 C. 16 D. 18 E. NOTA

12. Solve. $2x + 16 - 3x + 2 = 4x - 15 - 3x + 5$

A. 4 B. 3 C. 14 D. 8 E. NOTA

13. What is the 147th term of this arithmetic sequence: 9, 15, 21, 27…?

A. 885 B. 873 C. 856 D. 891 E. NOTA

14. Simplify: $-5^0 - 3^0 - (-3)^0$.

A. -1 B. 0 C. -5 D. -3 E. NOTA

15. There are 12 types of pizza toppings at Pizza Shack, but you can only choose 3. How many combinations can you make?

A. 36 B. 1320 C. 220 D. 120 E. NOTA

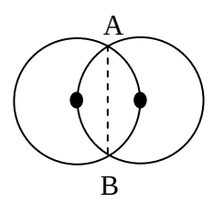
16. Find the sum: $1 + 2 + 3 + 4 + \ldots + 77 + 78$.

A. 3081 B. 3091 C. 3181 D. 3042 E. NOTA

17. Four dwarves can paint 36 barns in 12 days. How many barns can 15 dwarves paint in 4 days?

A. 42 B. 45 C. 36 D. 30 E. NOTA

18. In the figure below, two congruent circles overlap. What is the distance between point A and point B if the circle's radius is 3 cm?



A. 6 cm B. 3 cm C. $3\sqrt{3}$ cm D. $5\sqrt{3}$ cm E. NOTA

19. If x = the number of zeros at the end of 20!, $y = \left[\sqrt{(6^2 + 6^2 + 6^2 + 6^2 + 4^2 + 3^2 - 12^2)}\right]^2$ and z = the units digit of 3^{456}, find $xy - (x + y + z)$.

A. 52 B. 70 C. 68 D. 64 E. NOTA

20. It takes pump A 6 hours to fill a tank, and it takes pump B 12 hours to drain it. How long will it take to fill the tank?

A. 6 hr. B. 9 hr. C. 24 hr. D. 12 hr. E. NOTA

21. Find the measure of the smaller angle formed by the hands of a clock at 2:40.

A. 150° B. 160° C. 130° D. 180° E. NOTA

22. Find the ratio of the volume of a rectangular prism to the surface area of the rectangular prism if the length is 6 m, the width is 2 m, and the prism's height is 8 m.

A. $^{17}/_{19}$ B. $^{12}/_{19}$ C. $^{21}/_{19}$ D. $^{24}/_{19}$ E. NOTA

23. The ratio of the angles in a triangle is 5:6:7. What is the product of the two largest angles?

A. 130 B. 420 C. 4200 D. 3000 E. NOTA

24. How many natural numbers from 1-800 contain the digit 7 at least once?

A. 80 B. 152 C. 251 D. 233 E. NOTA

25. A rectangular box has width 8 inches, length 2 feet, and height 6 inches. What is the length of the longest fishing rod that will fit in the box?

A. 25 in. B. 25.4 in. C. 26 in. D. 26.2 in. E. NOTA

Tiebreakers ***Write each tiebreaker answer on the back of the scantron.***

TB1. The vertices of a triangle are (2,2), (2, 4) and (4,2). Find the perimeter.

TB2. Evaluate. $\sqrt{20\sqrt{20\sqrt{20\sqrt{20\ldots}}}}$

TB3. The points represented in the table below lie in a straight line. When the equation of the line is written in the form y = Ax + B, what is the value of B – A?

x	4	s - 4	s
y	7	2s – 9	2s - 1