

Pre-Algebra Exam

- A. 0 B. 3 C. 7 D. 2 E. NOTA

9. How many distinct ways can the letters in ROBOTIC be arranged?

- A. 5040 B. 2520 C. 28 D. 14 E. NOTA

10. Evaluate: $((2+4)^2 \cdot 3 + 17 - \frac{18}{3}) - 100$

- A. 11 B. 16 C. 21 D. 19 E. NOTA

11. “Low” cards are cards with a value of 5 or lower, including aces. Jackademus wants to draw three “low” cards. He draws three cards, one at a time, from a fair, 52-card deck (4 suits, each of which has 13 cards) without replacement. The first two cards he draws are “low”, so what is the probability that he meets his goal with the last draw?

- A. $\frac{1}{5}$ B. $\frac{3}{13}$ C. $\frac{9}{25}$ D. $\frac{6}{17}$ E. NOTA

12. $x^2 - 3x = 28$; $x = ?$

- A. -4, 7 B. -4, -7 C. 4, -7 D. 4, 7 E. NOTA

13. Find the slope of a perpendicular line to this equation: $15x - 38 = 3y + 2x + 12$

- A. $\frac{3}{13}$ B. $-\frac{3}{13}$ C. $\frac{13}{3}$ D. $-\frac{13}{3}$ E. NOTA

14. A square and a triangle have equal perimeters. The lengths of the three sides of the triangle are 6.2 cm, 8.3 cm, and 9.5 cm. What is the area of the square, in cm^2 ?

- A. 24 B. 36 C. 68 D. 64 E. NOTA

15. Find: $f(g(h(5)))$ given that:

$$\begin{aligned}h(x) &= x(x-4) \\g(x) &= x^2 - 2x + 1 \\f(x) &= \frac{1}{x^2 + 1}\end{aligned}$$

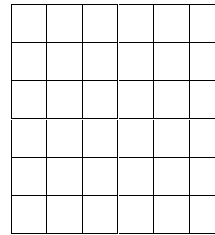
- A. $\frac{1}{257}$ B. $\frac{1}{2}$ C. $\frac{1}{256}$ D. $\frac{1}{441}$ E. NOTA

16. Find the area of a triangle with sides 8, 15, and 17.

- A. 42 B. 80 C. 65 D. 60 E. NOTA

17. How many squares are in this six by six grid?

- A. 78
- B. 55
- C. 91
- D. 81
- E. NOTA



18. At the round table sat Prince Nath, Knight Saloni, Lady Sruti, Queen Lugemwa, Royal Jasmin, and Supreme Chancellor Chin. They have to stand in line to get their orders. In how many distinct arrangements can these people be lined up?

- A. 720
- B. 24
- C. 6
- D. 120
- E. NOTA

19. Turner has \$240 more than my cousin Om, who has \$150 more than Ava. Together the three people have \$990. How much money, in dollars, does Ava have?

- A. \$150
- B. \$200
- C. \$390
- D. \$450
- E. NOTA

20. Simplify the following.

$$\frac{3^{\frac{3}{2}} \times 2^{\frac{1}{2}}}{3^{\frac{2}{3}} \times 2^{\frac{1}{6}}}$$

- A. $3^{\frac{5}{9}} \times 2^{\frac{2}{3}}$
- B. $3^{\frac{5}{6}} \times 2^{\frac{1}{3}}$
- C. $3 \times 2^{\frac{1}{12}}$
- D. $3^{\frac{9}{4}} \times 2^3$
- E. NOTA

21. The center of circle O is (2,2) and a point on the circle is (5,6). Find the diameter.

- A. 10
- B. $2\sqrt{5}$
- C. 5
- D. $\sqrt{113}$
- E. NOTA

22. Jim Smith is in the Math/Science department at the Alabama School of Fine Arts. In how many distinct ways can you arrange the letters in his last name?

- A. 240
- B. 60
- C. 120
- D. 250
- E. NOTA

23. Find the mean of x , y and z where x , y , and z are all positive integers.

$$\begin{aligned} xy &= 2 \\ yz &= 6 \\ xz &= 3 \end{aligned}$$

- A. 6
- B. 3
- C. 12
- D. 2
- E. NOTA

24. A cube has a side length of 4. Another cube has half the side length of the first. Find the ratio of the larger cube's volume to the smaller cube's volume.

- A. 4 B. 64 C. 8 D. 24 E. NOTA

25. If $a^2 - b = \frac{(a+b)^2}{ab}$ and $c^2 - d = \frac{(c-d)^2}{c^2d}$, for $a, c > 0$.

What is $9 \Delta (4 \Omega (-2))$?

- A. $\frac{1}{6}$ B. $-\frac{1}{5}$ C. $-\frac{1}{20}$ D. $\frac{1}{25}$ E. NOTA

TB1: The cost of 4 veggie burgers, 2 sodas, and 2 orders of ice cream sandwiches is \$24.50. At the same prices, the cost of 6 veggie burgers, 2 sodas, and 5 ice cream sandwiches is \$50.75. Also, the cost of 4 sodas and 2 ice cream sandwiches is \$8.50. What is the cost of a veggie burger at this restaurant?

TB2: On a bright day, Payton and Casey went on a trip to Nashville. They took the same highway there and back. On the way there, Payton drove at 40 mph because he is a safe driver. On the way back Casey drove 60 mph. What was their average speed for the entire trip?

TB3: Rearranging the digits of the number 579 produces different numbers. What is the sum of all such numbers, including 579?