For all questions, answer choice (E) NOTA means that none of the given answers is correct. Good Luck!

1. Evaluate $(7-3)^2 + 8 \div 2 - 5$.
   (A) 15 (B) 7 (C) -2 (D) 10 (E) NOTA

2. Find the slope of the line with the equation $2x - 3y = 7$.
   (A) $\frac{3}{2}$ (B) $\frac{2}{3}$ (C) $-\frac{2}{3}$ (D) $-\frac{3}{2}$ (E) NOTA

For questions 3-5, use the following information:
John is practicing for the upcoming Mu Alpha Theta season. The scores of his practice tests are 73, 84, 65, 57, and 91.

3. What is the mean of John's scores?
   (A) 74 (B) 75 (C) 76 (D) 77 (E) NOTA

4. What is the median of John's scores?
   (A) 57 (B) 65 (C) 73 (D) 84 (E) NOTA

5. John takes another test and the new mean of his scores is 76. What did he score on that test?
   (A) 82 (B) 84 (C) 86 (D) 88 (E) NOTA

6. Solve for x, given that $4x + 11 = 75$.
   (A) 15 (B) 21 (C) 22 (D) 16 (E) NOTA

7. Siddarth is driving from his house to the library. He drives 1 mile north, 3 miles east, and 3 more miles north. On his way home, he drives in a straight line. What is the total distance Siddarth traveled?
   (A) 7 (B) 14 (C) 12 (D) 10 (E) NOTA

8. Let $a \square b = \frac{(a-b)^2}{b}$. Find the value of $(6 \square 2) \square 4$.
   (A) 4 (B) 2 (C) 3 (D) 5 (E) NOTA

9. What is 25% of 60% of 40?
   (A) 12 (B) 6 (C) 24 (D) 18 (E) NOTA

10. What is the distance between the points (8,2) and (6,0)?
    (A) $\sqrt{2}$ (B) $2\sqrt{2}$ (C) 2 (D) 4 (E) NOTA

11. In mysterious England, there are 12 pence in a shilling, 20 shillings in a pound, and 4 farthings in a pence. How many farthings are in 3 pounds?
    (A) 48 (B) 240 (C) 960 (D) 2880 (E) NOTA

12. What is the sum of the positive integers that satisfy the inequality, $3x - 7 \leq 8$?
    (A) 15 (B) 10 (C) 20 (D) 18 (E) NOTA

13. Joe is traveling along the line $3x + 5y = -4$. Jim is traveling along the line $4x - 3y = 14$. At what point will their paths cross?

(A) $(-2, -2)$ (B) $(2, -2)$ (C) $(-2, 2)$ (D) $(2, 2)$ (E) NOTA

14. Find x if $3^{3x+6} = 9^{2x-7}$.

(A) -13 (B) 15 (C) 20 (D) 14 (E) NOTA

15. Which of the following equations passes through the point $(3, 4)$?

(A) $2x - 3y = 8$ (B) $x - 3y = -4$ (C) $3x + 3y = 19$ (D) $2x - 5y = -14$ (E) NOTA

16. Stephen and John are eating dinner at a fancy restaurant. Stephen orders 3 main courses and 2 desserts. John orders 2 main courses and 3 desserts. Stephen has to pay \$65 for his meal, and John has to pay \$60 for his meal. If every main course costs the same and every dessert costs the same, how much does 1 main course cost in dollars?

(A) 10 (B) 15 (C) 12 (D) 20 (E) NOTA

17. Stephen and John did not have the money to pay for their expensive dinners, and now they have to wash dishes. Stephen can wash all the dishes in 2 hours, and John can wash all the dishes in 3 hours. How many hours will it take for Stephen and John to wash the dishes if they work together?

(A) 1.2 (B) 1 (C) 2.5 (D) 0.8 (E) NOTA

18. Bob is driving to his grandmother's house to visit her over the weekend. Bob lives 60 miles away from his grandmother's house. If Bob drives there in 1 hour and drives back in 1.5 hours, what is his average speed for the whole trip?

(A) 50 mph (B) 60 mph (C) 52 mph (D) 40 mph (E) NOTA

19. Find the product of the roots of the equation $2x^2 + 2x - 24$.

(A) 12 (B) -12 (C) 9 (D) 16 (E) NOTA

20. Let $a + b = 5$ and $a^2 + b^2 = 11$. What is the value of ab?

(A) 14 (B) 11 (C) 7 (D) 25 (E) NOTA

21. Which of the following equations has exactly 2 distinct solutions?

I. $x^2 + 3x - 7 = 0$

II. $2x^2 + 4x + 2 = 0$

III. $x^2 - 3x - 2 = 0$

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

For questions 22-24, use the following information:
Stephen and Abhi decide to sail in Abhi's yacht. They sail out in a straight line from the shore at a speed of 25 knots at 10:00 AM. (1 knot equals 1 nautical mile per hour) After sailing for 3 hours, they hit an iceberg that breaks two holes in the hull. Water begins to rush through holes and fill the interior of the yacht. Water rushes through one hole at a rate that would sink the yacht in 72 minutes. Water rushes through the other hole at a rate that would sink the yacht in 2 hours.

22. How long would it take in minutes for the yacht to sink with water rushing through both holes?

(A) 96 (B) 60 (C) 45 (D) 48 (E) NOTA

23. After 10 minutes, Stephen takes the only lifeboat and travels back to shore along the same route they came without Abhi at a speed of 15 knots. How long in minutes after the yacht sinks will Stephen reach the shore?

(A) 265 (B) 300 (C) 255 (D) 245 (E) NOTA

24. 20 minutes after Stephen leaves on the lifeboat, a rescue boat rescues Abhi and travels back to shore along the same route as Stephen at a speed of 45 knots. At what time will the rescue boat pass Stephen?

(A) 1:00 PM (B) 1:10 PM (C) 1:20 PM (D) 1:30 PM (E) NOTA

25. Which of the following is the equation of a line that is perpendicular to the line $4x - 6y = 12$ and has the same x-intercept as the line $x + 5y = 3$?

(A) $3x - 2y = 9$ (B) $3x + 2y = 9$ (C) $2x + 3y = 11$ (D) $3x + 2y = 11$ (E) NOTA

26. Given that $y = 2x + 5$, find the value of x if $\dfrac{3y^2 + 5y - 12}{y + 3} = 23$.

(A) 2 (B) 9 (C) 11 (D) 4 (E) NOTA

For questions 27-30, use the following information:
Awnish opens a lemonade stand, and makes 3 gallons of lemonade. He wants to sell as much lemonade as he can, but is too lazy to make more lemonade. He decides to add water to his lemonade and dilute it so that it is a 60% lemonade solution. He names his new solution Awnish-ade.

27. How many pints of Awnish-ade does Awnish have?

(A) 24 (B) 80 (C) 48 (D) 60 (E) NOTA

28. Awnish manages to sell 4 pints of Awnish-ade, but nobody else will buy his drink because it is too watered down. Awnish makes more lemonade and mixes it with his Awnish-ade so that it is now an 80% lemonade solution. How many more gallons of lemonade did Awnish make?

(A) 4 (B) 4.5 (C) 5 (D) 5.5 (E) NOTA

29. Awnish now has a lot of Awnish-ade, and is selling it for \$1.50 per pint. Awnish sells enough Awnish-ade to make \$33. How many pints of Awnish-ade does Awnish have left?

(A) 22 (B) 33 (C) 50 (D) 52 (E) NOTA

30. Siddarth is jealous of Awnish's lemonade business, and decides to start his own. Siddarth is too lazy to make his own lemonade, so he buys the rest of Awnish's Awnish-ade, adds water to dilute it to a 50% lemonade solution, and calls it Siddarth-ade. Siddarth sells all of his Siddarth-ade for \$1.00 per pint. How much profit did Siddarth make in dollars?

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