Random Topics. Form A

1. What is the product of $i(2-3i)$ $where$ $i=\sqrt{-1}$?

(A) $3+2i$
(B) $3-2i$
(C) $2i-3$
(D) 5
(E) $\sqrt{3}+2i$

2. The expression $\frac{2i}{1+i}$ is equivalent to? Note that $i=\sqrt{-1}$

(A) $1+2i$
(B) $2+i$
(C) $1-i$
(D) $1-2i$
(E) $1+i$

3. Which of the following is a solution to $x^2+4=0$?

(A) $\sqrt{2}$
(B) $2i$
(C) $4i$
(D) -2
(E) $\sqrt{2}i$

4. What is the number 350,000,000 in scientific notation?

(A) 3.5 x 10^6
(B) 35 x 10^8
(C) 3.5 x 10^8
(D) 350 x 10^9
(E) 3.5 x 10^{-8}

5. What is the number 0.00000263 in scientific notation?

(A) 2.63 x 10^{-6}
(B) 263 x 10^{-8}
(C) 2.63 x 10^6

(D) 1 x 10^{-263}
(E) 2.63 x 10^{-8}

6. What is 3.4 x 10^5 + 9.7 x 10^6 equal to?

(A) 10.04 x 10^7
(B) 10.04 x 10^{11}
(C) 1.004 x 10^9
(D) 1.004 x 10^7
(E) 1.004 x 10^{-7}

7. What is (3.4 x 10^{-2}) (6.2 x 10^6) equal to?

(A) 2.108 x 10^4
(B) 2.108 x 10^{-12}
(C) 2.108 x 10^5
(D) 21.08 x 10^5
(E) 2.108 x 10^{-5}

8. $\frac{8.4\ x\ 10^5}{1.4\ x\ 10^{-2}} = ?$

(A) 6 x 10^7
(B) 6 x 10^{-7}
(C) 60 x 10^8
(D) 60 x 10^{-8}
(E) 6 x 10^3

9. What is the next number in the pattern below?

0, 3, 8, 15, 24, ...

(A) 33
(B) 35
(C 36
(D 40
(E) 37

10. What is the sum of the next three numbers in the pattern below?

1, 3, 6, 10, 15, 21, ...

(A) 95
(B) 100
(C 99
(D 115
(E) 109

11. The sum of 5 consecutive integers is 505. What is the second number?

(A) 101
(B) 100
(C 105
(D 90
(E) 99

12. The sum of 5 consecutive integers is 35. What is the median of the 5 consecutive integers?

(A) 5
(B) 7
(C) 8
(D) 9
(E) 3

13. Which of the following is NOT a solution to $x(x-2)(x+3)(x+5)=0$?

(A) 5
(B) -5
(C) 0
(D) 2
(E) -3

14. Which of the following is a factor for of the expression x^2-9?

(A) $(x-3)(x-3)$
(B) $(x-1)(x+9)$
(C) $(x-3)(x+3)$
(D) $(x+1)(x-9)$

(E) $(2x-3)(2x+3)$

15. Which of the following is a factor for of the expression $5x^2 - 13x - 6$?

(A) $(5x+6)(x-1)$
(B) $(5x-6)(x+1)$
(C) $(5x-3)(x-2)$
(D) $(5x+2)(x-3)$
(E) $(5x-3)(x+2)$

16. What is the value of the expression $\frac{16!}{14!}$? Note: n!= (n-1)(n-2)(n-3).....(3)(2)(1).

(A) 14
(B) 16
(C) 240
(D) 224
(E) 2

17. What is the determinant of the matrix shown below?

$$\begin{vmatrix} 8 & 3 \\ -5 & -2 \end{vmatrix}$$

(A) -1
(B) 34
(C) -25
(D) -31
(E) 31

18. Which of the following matrices is equal to

$$\begin{bmatrix} 9 & 8 \\ -4 & 7 \end{bmatrix} + \begin{bmatrix} -6 & 6 \\ 5 & 4 \end{bmatrix}$$

(A) $\begin{bmatrix} 3 & 14 \\ 1 & 11 \end{bmatrix}$

(B) $\begin{bmatrix} 3 & 14 \\ 9 & 11 \end{bmatrix}$

(C) $\begin{bmatrix} 15 & 14 \\ 9 & 11 \end{bmatrix}$

(D) $\begin{bmatrix} 17 & 0 \\ 3 & 9 \end{bmatrix}$

(E) $\begin{bmatrix} -14 & 86 \\ 59 & 4 \end{bmatrix}$

19. What must be the value of a for the matrix $\begin{bmatrix} -2 & -3 \\ a & 1 \end{bmatrix}$ $to\ have\ a\ determinant\ of$ 10?

(A) -4
(B) 4
(C) 3
(D) -3
(E) 5

20. What is the equation of the vertical ellipse(major axis is parallel to the y-axis) centered at (1,8) and with a minor radius of 2 and a major axis of 3?

(A) $\frac{(x-1)^2}{4} + \frac{(y-8)^2}{9} = 1$
(B) $\frac{(x-1)^2}{9} + \frac{(y-8)^2}{4} = 1$
(C) $\frac{(x+1)^2}{4} + \frac{(y+8)^2}{9} = 1$
(D) $\frac{(x+1)^2}{9} + \frac{(y+8)^2}{4} = 1$
(E) $\frac{(x-1)^2}{4} + \frac{(y-8)^2}{9} = 13$

Answers

1. A
2. E
3. B
4. C
5. A
6. D
7. C
8. A
11. B
12. B
13. A
14. C
15. D
16. C
17. A
18. A

9. B 19. B
10. E 20. A