1. Find the product of the two largest of three consecutive odd integers where ten times the smallest exceeds six times the SUM of the two largest by thirty.

a) 1155 b) 1023 c) 899 d) 784 e) none of these

2. Al has \$3.18 in pennies, nickels, and dimes. He has twice as many dimes as nickels and he has $\frac{2}{3}$ as many nickels as pennies. Find the total number of coins in Al's piggy bank.

a) 50 b) 51 c) 52 d) 53 e) none of these

3. Find the ratio of eight kilometers to four miles. Assume that 1 inch equals 2.54 cm. Round your final answer to the nearest 0.001.

a) 1.243 b) 1.245 c) 1.247 d) 1.249 e) none of these

4. $x * y = \frac{x - y}{xy}$. Find 10 * (6 * 2).

a) $\frac{27}{10}$ b) $\frac{10}{27}$ c) $\frac{29}{10}$ d) $\frac{10}{29}$ e) none of these

5. $2^{2^{3^2}}$ equals

a) 2^{640} b) 2^{512} c) 2^{64} d) 2^{18} e) none of these

6. A man is forty-one years old and his son is nine years old. In how many years will the father be three times as old as the son.

a) 11 b) 10 c) 9 d) 8 e) none of these

7. You mix 30% acid solution with 50% acid solution to make 100 pints of acid solution that is 41% acid and 59% water. How many pints of the 50% acid solution are needed?

a) 45 b) 50 c) 55 d) 60 e) none of these

8. If $A = x^4 - 16, B = x^2 - 4, C = x^2 - 3x + 2$, find the (least common multiple of A, B, and C) divided by the (greatest common factor of A, B, and C).

a) $(x^2 + 4)(x - 2)(x - 1)$ b) $(x^2 + 4)(x + 2)(x - 2)$

c) $(x^2 + 4)(x + 2)(x - 1)$ d) $(x + 2)(x - 2)(x - 1)$ e) none of these

9. Find *mb* whenever $y = mx + b$ is the equation of the straight line which passes through the two points (-7, 13) and (5, -2).

a) -5.0625 b) -5.1875 c) -5.3125 d) -5.4375 e) none of these

10. A and B working together can do a job in seven hours. A is twice as productive as B. Find the number of hours for A to do ten of these same jobs when he works alone.

a) 101 b) 102 c) 103 d) 104 e) none of these

11. All of the outside surfaces of a large cylindrical tank are to be painted. The tank is 10 meters tall and the circular bases have a diameter of 15 meters. How many quarts of paint are needed if one quart will cover 10 square meters? Round your answer to the nearest 0.001.

a) 82.468 b) 82.466 c) 82.464 d) 82.462 e) none of these

12. $f(x) = 8x + 7$ and $g(x) = -3x^2 + 6x - 2$. If $f(g(x)) = ax^2 + bx + c$, find $a + b + c$.

a) 18 b) 17 c) 16 d) 15 e) none of these

13. A segment of a circle is bounded by an arc and the chord which connects the endpoints of the arc. Find the area of a 40 degree segment of a circle whose radius is 10. Round your final answer to the nearest 0.001 unit.

a) 2.761 b) 2.763 c) 2.765 d) 2.767 e) none of these

14. The two solutions of $x^2 = 5x - 3p + 3$ are a and b. Also $a - b = 11$. Find P.

a) -6 b) -7 c) -8 d0 -9 e) none of these

15. $\frac{1+i}{3-i} = x + yi$. Find $x + y$ whenever $i^2 = -1$.

a) 0.40 b) 0.45 c) 0.50 d) 0.55 e) None of these

16. $\frac{3\sqrt{3}}{4\sqrt{2}} = \frac{3k^{\frac{1}{6}}}{8}$. Find k.

a) 434 b) 436 c) 438 d) 440 e) none of these

17. Find the number of positive integers which are exact divisors of 2002^2.

a) 32 b) 64 c) 81 d) 96 e) none of these

18. From eleven different novels and three different dictionaries we are to select four novels and one dictionary. The 5 books selected are to be arranged on a shelf with the dictionary in the middle. How many ways can this be done?

a) 23,760 b0 23,860 c) 23,960 d) 24,160 e) none of these

19. In triangle ABC: AB = 6, AC = 10, Angle ACB = 30º. There are two possible values of BC. Find the positive difference of these two possible values of BC.

a) $2\sqrt{6}$ b) $2\sqrt{7}$ c) $2\sqrt{10}$ d) $2\sqrt{11}$ e) none of these

20. Find the sum of the first 200 terms of the arithmetic sequence whose eleventh term is –210 and whose 30^{th} term is –153.

a) 11,331 b) 11,430 c) 11,610 d) 11,700 e) none of these

21. $\lim_{x\to 0}\dfrac{12\sin x}{x^2+3x}$

a) 7 b) 6 c) 5 d) undefined e) none of these

22. $\lim_{x\to 0}\dfrac{-3+\sqrt{9+x}}{x}$

a) $\frac{1}{3}$ b) $\frac{1}{6}$ c) $\frac{1}{9}$ d) $\frac{1}{12}$ e) none of these

23. $\dfrac{12cis54°}{3cis24°} = x + yi$ where $i^2 = -1$. Find $x^2 y$.

a) 48 b) 42 c) 30 d) 26 e) none of these

24. Find the area of the triangle whose vertices are the points (0, 0, 0), (2, 3, 4), and (5, 6, 7). Round your final answer to the nearest 0.001.

a) 3.674 b) 3.675 c) 3.676 d) 3.677 e) none of these

Solutions

1. C
2. E
3. A
4. C
5. B
6. E
7. C
8. C
9. C
10. E
11. B
12. D
13. D
14. B
15. E
16. E
17. C
18. A
19. D
20. D
21. E
22. B
23. E
24. A