1. Joe goes on a trip. He does the first 100 miles in 20 hours. He does the remaining 60 miles in 4 hours. His average speed for the entire trip is x miles per hour. Find x.

a) 10 b) $\frac{22}{3}$ c) $\frac{20}{3}$ d) 6 e) none of these

2. Give the base 10 representation of a number whose base three representation is 201.

a) 55 b) 22 c) 19 d) 9 e) none of these

3. Find $\frac{2}{3}x+4$ whenever $5x-6=7$.

a) $\frac{86}{15}$ b) $\frac{84}{15}$ c) $\frac{82}{15}$ d) $\frac{78}{15}$ e) none of these

4. Find the SUM of the digits of the least common multiple of 12, 20, and 45.

a) 12 b) 11 c) 10 d) 9 e) none of these

5. For every 220 students awarded a scholarship, 5280 had applied. If 869 students were awarded a scholarship, how many had applied?

a) 20856 b) 20860 c) 20864 d) 20868 e) none of these

6. Five years ago, Al was twice as old as his sister Bev. Twice Al's age now exceeds twice Bev's age now by 12 years. Find Al's age now.

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

7. A convex octagon has how many diagonals?
a) 18 b) 20 c) 24 d) 40 e) none of these

8. Find the number of square units of area in a trapezoid whose sides are 10, 10, 10, and 26.
a) 100 b) 102 c) 104 d) 106 e) none of these

9. Point E is inside triangle ABC. Line segment AE bisects angle CAB. Line segment BE bisects angle CBA. Angle ACB is 72°. The obtuse angle AEB is x°. Find x.
a) 120 b) 122 c) 124 d) 126 e) none of these

10. Twenty men can make 15 cars in 2 days. How many men should it take to make twice as many cars in one-half day?
a) 164 b) 162 c) 160 d) 158 e) none of these

11. There are 100 people at a party. Each person shakes hands with each of the other 99 people. Find the minimum number of handshakes needed.
a) 9900 b) 4950 c) 4800 d) 2475 e) none of these

12. Find the sum of the first 137 odd positive integers. [Hint: Find 1 + 3. Find 1 + 3 + 5. Find 1 + 3 + 5 + 7.]
a) 18496 b) 18769 c) 19044 d) 19441 e) none of these

13. Find the number of square units of total outside surface area for a regular tetrahedron whose height is 10. Round the final answer to the nearest 0.001 unit.
a) 259.805 b) 259.806 c) 259.807 d) 259.808 e) none of these

14. The volume of a hemisphere is x cubic units. The total outside surface area of this hemisphere (including the base) is 1200π square units. Find x. Round the final answer to the nearest 0.001 unit.
a) 16753.161 b) 16754.161 c) 16755.161 d) 16756.161 e) none of these

15. Suppose that the solution set of equation $x^3 = 8$ is $\{a, b, 2\}$. Find $ab - a - b$.
a) 9 b) 8 c) 7 d) 6 e) none of these

16. The frustum of cone is that part of the cone included between the base of the cone and a plane which intersects the cone and is parallel to the base. Find the number of cubic units of volume in the frustum of a right circular cone whose bases have radii 15 and 6 and whose height is 12. Round your final answer to the nearest 0.001.
a) 4410.794 b) 4410.795 c) 4410.796 d) 4410.797 e) none of these

17. The median of a trapezoid is the line segment which joins the middle points of the nonparallel sides. The bases of a trapezoid are 4 and $\frac{29}{5}$. Find the length of that part of the median which is included between the diagonals.
a) 0.90 b) 0.85 c) 0.80 d) 0.75 e) none of these

18. How many different sums of money (more than zero) can be drawn from a wallet containing one bill each of 1, 2, 5, 10, 20, and 50 dollars?
a) 32 b) 36 c) 48 d) 60 e) none of these

19. A 20 foot long ladder leans against a vertical wall. The bottom of the ladder (at ground level) is pulled away from the wall at the rate of 3 feet per second. When the top of the ladder is exactly 10 feet above the ground, the angle between the ladder and the ground is decreasing at x radians per second. Find x. Round the final answer to the nearest 0.001.

a) 0.45 b) 0.40 c) 0.35 d) 0.30 e) none of these

20. Let R be the region in the first quadrant bounded by $3x + 5y = 15$ and the coordinate axes. Find the number of cubic units of volume generated by rotating the region R about the x-axis.

a) 15π b) 16π c) 18π d) 20π e) none of these

21. The general ideal gas law implies that when temperature is held constant, pressure and volume are inversely proportional. Suppose we have 500 cubic meters of gas at pressure 120 Newtons per cubic meter. The pressure is increasing at 6 Newtons per square meter per minute. When the pressure is 150 Newtons per square meter, the rate at which the volume is decreasing is x cubic meters per minute. Find x.

a) 16 b) 18 c) 20 d) 24 e) none of these

22. Find $m + b$ where $y = mx + b$ is the equation of the straight line which is tangent to the graph of $xy = 100$ at the point where $x = 5$.

a) 44 b) 42 c) 44 d) 36 e) none of these

23. Bo makes 70% of his foul shots. Find the probability that he will make exactly 3 out of 5 foul shots in the big game against the LAFM.

a) 0.3085 b) 0.3086 c) 0.3087 d) 0.3088 e) none of these

24. Find the value of x^3 whenever $x^2 = \lim_{h \to o} \dfrac{(5+h)^2 - 25}{h}$. Round the final answer to the nearest 0.001 unit.

a) 31.620 b) 31.621 c) 31.622 d) 31.623 e) none of these

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