Time- 25 Minutes 20 Questions

Directions: For this section, solve each problem and decide which is the best of the choices given. Fill in the corresponding oval on the answer sheet. You may use any available space for scratchwork.

1. Calculator use is permitted.
2. All numbers used are real numbers

包 3. Figures are provided for some problems. All figures are drawn to scale and lie in a plane UNLESS otherwise indicated.
4. Unless otherwise specified, the domain of any function $f$ is assumed to be the set of all real numbers $x$ for which $f(x)$ is a real number.
Reference Information

$A=\frac{1}{2} b h$

$V=\ell w h$

$V=\pi r^{2} h$

$A=\ell_{w}$

The sum of the measures in degrees of the angles of a triangle is 180
The number of degrees of arc in a circle is 360 .
A straight angle has a degree measure of 180 .

## Annual Sales at a Clothing Store



1 If the store's sales represented in the graph above totaled $\$ 1.8$ million, what were the sales to purchasers of casual clothing?
(A) $\$ 180,000$
(B) $\$ 225,000$
(C) $\$ 360,000$
(D) $\$ 450,000$
(E) $\$ 900,000$

2 The number of red jellybeans eaten by a group of children varies inversely with the number of green jellybeans eaten. If 50 red jellybeans are eaten when 25 green jellybeans are eaten, how many green jellybeans are eaten when 5 red jellybeans are eaten?
(A) 5
(B) 25
(C) 60
(D) 95
(E) 250

22


Figure I

Note: Figure not drawn to scale.
3 Based on the information in Figure I above, what is the value of $y$ in Figure II?
(A) 120
(B) 75
(C) 60
(D) 45
(E) 30

Figure II
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4 In a certain solution of water and syrup, the ratio by volume of the amount of water to the amount of syrup is 8 to 5 . If the volume of the syrup is 40 cubic inches, what is the volume, in cubic inches, of the water?
(A) 24
(B) 25
(C) 40
(D) 64
(E) 104

6 If $n>0$ and $\left(8^{\frac{4}{n}}\right)^{-3}=\left(2^{-n}\right)^{\frac{3}{4}}$, then $n$ equals
(A) $12 \sqrt{3}$
(B) 8
(C) $4 \sqrt{3}$
(D) 4
(E) $2 \sqrt{3}$

7 If $f(x)=x^{2}-x$ and $g(x)=x^{2}-1$, what is the value of $f(g(3))$ ?
(A) 35
(B) 48
(C) 56
(D) 60
(E) 61

9 If $5 a-2>41$, which of the following describes all possible values of $a$ ?
(A) $a>8.6$
(B) $a>7.8$
(C) $a=7.8$
(D) $a<7.8$
(E) $a<8.6$


8 On the number line above, each of the letters $P, Q, R, S$, and $T$ corresponds to a different number. Which of those letters could correspond to the value of $X Y$ ?
(A) $P$
(B) $Q$
(C) $R$
(D) $S$
(E) $T$

$$
x, y, z, 65
$$

10 In the sequence of positive integers above, each term, starting with the second, is one less than double the previous term. What is the value of $x$ ?
(A) 1
(B) 7.25
(C) 9
(D) 17
(E) 525


11 In the figure above, square $A B C D$ is inscribed in the circle with center $O$ and radius $3 \sqrt{2}$. What is the perimeter of square $A B C D$ ?
(A) 9
(B) 12
(C) 18
(D) 24
(E) 36

13 In a list of 24 different numbers, 18 of the numbers are less than 12 , and 12 of the numbers are greater than 6. How many of these numbers are both greater than 6 and less than 12?

| (D) | 6 |
| :--- | :--- |
| (B) | 8 |
| (C) | 10 |
| (D) 12 |  |
| (E) | 14 |

(B) 6
(C) 10
(D) 12
(E) 14

12 If the average (arithmetic mean) of $a, b$, and $c$ is $z$, what is the average of $a$ and $b$ in terms of $c$ and $z$ ?
(A) $\frac{z-c}{2}$
(B) $\frac{z+c}{2}$
(C) $\frac{3 z-c}{2}$
(D) $3 z-c$
(E) $3 z+c$


In the figure above, each triangle is equilateral. If triangle $X Y Z$ has an area 75 , what is the sum of the areas of the shaded triangles?
(A) 25
(B) 30
(C) 32.5
(D) 37.5
(E) 45

15 In the $x y$-coordinate plane, if both $x$ and $y$ are integers, how many points $(x, y)$ lie on the line $3 x+6 y=29$ ?
(A) None
(B) One
(C) Two
(D) Four
(E) Infinitely many


17 The figure above shows the size and price of five different brands of chocolate bar. Which brand costs the least per ounce?
(A) $A$
(B) $B$
(C) $C$
(D) $D$
(E) $E$

16 Jon is $d$ inches tall and he is $\frac{d}{3}$ inches taller than Ali. What is Ali's height in terms of $d$ ?
(A) $\frac{d}{3}$
(B) $\frac{d}{2}$
(C) $\frac{2 d}{3}$
(D) $\frac{3 d}{2}$
(E) $2 d$

18 The sum of four different negative integers equals -12 . What is the least value that one of these integers could have?
(A) -9
(B) -6
(C) -4
(D) -3
(E) -2

19
In order for a piece of luggage to fit in the overhead compartment of a certain airplane, the sum of the height of the luggage and the perimeter of the base of the luggage must be less than or equal to 124 inches. If a piece of luggage has height 40 inches and width 18 inches, what is the maximum possible length of the luggage?
(A) 76 inches
(B) 48 inches
(C) 36 inches
(D) 33 inches
(E) 24 inches


In the figure above, a smaller circle is inscribed in a square, which is inscribed in a larger circle. If a point on the figure is chosen at random, what is the probability that the point is in the shaded area?
(A) $\frac{1}{4 \pi}$
(B) $\frac{4-\pi}{2 \pi}$
(C) $\frac{\pi-1}{2 \pi}$
(D) $\frac{\pi-2}{\pi}$
(E) $\frac{2}{\pi}$

