WS 8—Skills 31-35

Directions: For this section, solve each problem and decide which is the best of the choices given. Circle the corresponding capital letter. You may use any available space for scratchwork.

Notes:
1. The use of a calculator is permitted.
2. All numbers used are real numbers.
3. Figures that accompany problems in this test are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that the figure is not drawn to scale. All figures 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.

1. If 20 percent of 30 percent of a positive number is equal to 10 percent of k percent of the same number, what is the value of k?
   (A) 80
   (B) 60
   (C) 40
   (D) 15
   (E) 10

2. The price of a music CD was first increased by 15 percent and then the new price was decreased by 30 percent. The final price was what percent of the initial price?
   (A) 75%
   (B) 78%
   (C) 80.5%
   (D) 82%
   (E) 84.5%

3. If $2a+3b$ is equal to 250 percent of $6b$, what is the value of $\frac{a}{b}$?
   (A) $\frac{1}{6}$
   (B) $\frac{1}{3}$
   (C) 3
   (D) 6
   (E) 9

4. If 25 percent of m is 50, what is 15 percent of $2m$?
   (A) 80
   (B) 60
   (C) 50
   (D) 40
   (E) 30

5. The cost of an automobile increases each year by 2.5 percent, and the cost this year is \$20,000. If the cost c of the automobile is given by $c(n) = 20{,}000x^n$, what is the value of x?
   (A) 2.5
   (B) 1.25
   (C) 1.025
   (D) 0.25
   (E) 0.025

6. Tom's salary was increased from \$500 to \$1000 this week. By what percent was his salary increased?
   (A) 10%
   (B) 50%
   (C) 100%
   (D) 200%
   (E) 250%

7. If the price of a stock rises by 6 percent one day and falls by 5 percent the next day, what was the change in the price of the stock after these two days?
   (A) The price rose by 10%
   (B) The price rose by 7%
   (C) The price rose by 5%
   (D) The price rose by 1%
   (E) The price rose by 0.7%

8. If A is 25 percent of $2B$, then B is what percent of A?
   (A) 50%
   (B) 75%
   (C) 100%
   (D) 200%
   (E) 250%

9. If the cost of a 6-minute phone call is \$1.20, then at this rate, what is the cost of a 15-minute call?
   (A) \$2.00
   (B) \$3.00
   (C) \$3.25
   (D) \$3.75
   (E) \$3.98

10. In 5 years the ratio of Julie's age to Song's age will be 3:5. In 10 years the ratio of Julie's age to Song's age will be 2:3. What is the sum of their current ages?
    (A) 15
    (B) 20
    (C) 30
    (D) 35
    (E) 40

11. If $\frac{x}{y}=\frac{2}{3}$ and $2x+5y=76$, what is the value of x?
    (A) 2
    (B) 4
    (C) 8
    (D) 16
    (E) 20

12. A bag contains 3 red marbles and 3 blue marbles. What is the probability that you draw two red marbles without replacement?
    (A) $\frac{1}{9}$
    (B) $\frac{1}{6}$
    (C) $\frac{1}{5}$
    (D) $\frac{1}{3}$
    (E) $\frac{2}{5}$

13. The three cards shown above were taken from a box of ten cards, each with a different integer on it from 1 to 10. What is the probability that both of the next two cards selected from the box will have even integers on them?
    (A) $\frac{10}{21}$
    (B) $\frac{12}{23}$
    (C) $\frac{4}{7}$
    (D) $\frac{5}{7}$
    (E) $\frac{6}{7}$

14. In a box, there are b blue marbles and g green marbles. If a person selects two marbles, what is the probability that both marbles are blue?
    (A) $\frac{b}{b+g}$
    (B) $\frac{b}{b+g+1}$
    (C) $\frac{b\times b}{b+g}$
    (D) $\frac{b\times b}{(b+g)(b+g-1)}$
    (E) $\frac{b(b-1)}{(b+g)(b+g-1)}$

15. What is the probability that three quarters tossed in the air will land with only one head facing up?
(A) $\frac{1}{8}$
(B) $\frac{1}{4}$
(C) $\frac{3}{8}$
(D) $\frac{1}{2}$
(E) $\frac{2}{3}$

16. A traffic signal is green for 40 seconds, red for 35 seconds, and yellow for 10 seconds. If this cycle continues, what is the probability that a driver will encounter a green signal?
(A) $\frac{6}{17}$
(B) $\frac{8}{17}$
(C) $\frac{10}{17}$
(D) $\frac{2}{5}$
(E) $\frac{3}{7}$

17. If a number is chosen at random form the set $\{-15,-10,-5,0,5,10,15,20\}$, what is the probability that it is a member of the solution set of $|x+2|<8$?
(A) 0
(B) $\frac{1}{4}$
(C) $\frac{2}{5}$
(D) $\frac{3}{8}$
(E) $\frac{2}{3}$

18. Marbles are randomly selected from a container. If there are 5 different colors and a person wants to make sure that at least 3 of the same color are selected, what is the minimum number of marbles he must select?
(A) 5
(B) 7
(C) 8
(D) 11
(E) 15

19. Socks of 4 different colors are in a drawer. A person wants to select at least three socks of the same color. What is the least number of socks he must select?
(A) 7
(B) 8
(C) 9
(D) 10
(E) 12

20. A box contains marbles of four different colors. What is the least number of marbles you would need to take from the box to make sure you have three of the same color?
(A) 9
(B) 10
(C) 11
(D) 12
(E) 15

21. In the *xy*-plane, the midpoint of $\overline{AB}$ is $(10,4)$. If the coordinates of point A are $(5,1)$, then what are the coordinates of point B?
(A) $(5,3)$
(B) $(6,4)$
(C) $(15,5)$
(D) $(7.5,2.5)$
(E) $(15,7)$

22. If point $M(a,b)$ is the midpoint of the line segment connecting point $A(2a,b)$ and point $B(x,y)$, what is the value of y?
(A) 0
(B) 1
(C) a
(D) b
(E) $a+b$

23. In ΔABC on a coordinate plane, the coordinates of A are $(-4,4)$ and the coordinates of B are $(4,4)$. If the area of ΔABC is 24, which of the following could be the coordinates of C?
(A) $(3,8)$
(B) $(2,10)$
(C) $(0,-3)$
(D) $(2,-5)$
(E) $(-6,-4)$

24. If the distance between $(a,3)$ and $(b,8)$ is 13, then what is the value of $|a-b|$?
(A) 3
(B) 4
(C) 8
(D) 12
(E) 16

Problem Number	Correct Answer	Skill Number
1	B	31
2	C	31
3	D	31
4	B	31
5	C	31
6	C	31
7	E	31
8	D	31
9	B	32
10	C	32
11	C	32
12	C	33
13	A	33
14	E	33
15	C	33
16	B	33
17	D	33
18	D	34
19	C	34
20	A	34
21	E	35
22	D	35
23	B	35
24	D	35