1. \(|7 - 3| - |3 - 7| = ?

A. -8  
B. -6  
C. -4  
D. 0  
E. 8

\[
|4| - |-4| = 4 - 4
\]

2. A consultant charges $45 for each hour she works on a consultation, plus a flat $30 consulting fee. How many hours of work are included in a $210 bill for a consultation?

F. 2 4/5  
H. 4 2/3  
K. 7  
G. 4  
J. 5 1/2
3. Vehicle A averages 14 miles per gallon of gasoline. and Vehicle B averages 36 miles per gallon of gasoline. At these rates, how many more gallons of gasoline does Vehicle A need than Vehicle B to make a 1,008 mile trip?

   A. 25  C. 44  E. 72
   B. 28  D. 50

4. \( t^2 - 59t + 54 - 82t^2 + 60t \) is equivalent to:

   F. \(-26t^2\)
   G. \(-26t^6\)
   H. \(-81t^4 + t^2 + 54\)
   J. \(-81t^2 + t + 54\)
   K. \(-82t^2 + t + 54\)
5. The figure below is composed of square BCDE and equilateral triangle △ ABE. The length of CD is 6 inches. What is the perimeter of ABCDE, in inches?

- A. 18
- B. 24
- C. 30
- D. 42
- E. 45

6. The expression \((4z + 3)(z-2)\) is equivalent to:

- F. \(4z^2 - 5\)
- G. \(4z^2 - 6\)
- H. \(4z^2 - 3z - 5\)
- J. \(4z^2 - 5z - 6\)
- K. \(4z^2 + 5z - 6\)
7. If 40\% of a given number is 8, then what is 15\% of the given number?

<table>
<thead>
<tr>
<th></th>
<th>A. 1.2</th>
<th>C. 3.0</th>
<th>E. 6.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.</td>
<td>1.8</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. The consecutive integers below add up to 447

\[
x - 2 \quad \text{What is the value of } x ?
\]

<table>
<thead>
<tr>
<th></th>
<th>F. 72</th>
<th>G. 73</th>
<th>H. 74</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x - 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x + 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x + 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x + 3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
x \times 5 = 447
\]

[Equation: \(0.4(x) = 8\)]
9. In the standard (x,y) coordinate plane, point M with coordinates (5,4) is the midpoint of AB and B has coordinates (7,3). What are the coordinates of A
A. (17,11)  C. (6,3.5)
B. (9,2)     D. (3,5)
E. (-3,-5)

10. Rectangle ABCD has vertices A(4,5), B(0,2), and C(6,-6). These vertices are graphed below in the standard (x,y) coordinate plane. What are the coordinates of vertex D?
F. (10,-3)
G. (9,2)
H. (8,2)
J. (7,1)
K. (2,-9)
11. Daisun owns 2 sportswear stores (X and Y). She stocks 3 brands of T-shirts (A, B, and C) in each store. The matrices below show the numbers of each type of T-shirt. The value of Daisun's T-shirt inventory is computed using the cost listed. What is the total value of the T-shirt inventory for Daisun's 2 stores?

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>100</td>
<td>200</td>
<td>150</td>
<td>$5</td>
</tr>
<tr>
<td>Y</td>
<td>120</td>
<td>50</td>
<td>100</td>
<td>$10</td>
</tr>
</tbody>
</table>

- A. $2,200
- B. $2,220
- C. $4,965
- D. $5,450
- E. $7,350

12. Given the triangle shown below with exterior angles that measure $x^0$, $y^0$, and $z^0$ as shown, what is the sum of $x$, $y$, and $z$?

- F. 180
- G. 231
- H. 309
- I. 360
- J. 360
- K. Cannot be determined from the given information
Use the following information to answer questions 13-15

A poll of 200 registered voters was taken before the election for mayor of Springdale. All 200 voters indicated which 1 of the 4 candidates they would vote for. The results of the poll are given in the table below.

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Number of voters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackcloud</td>
<td>50</td>
</tr>
<tr>
<td>Lue</td>
<td>80</td>
</tr>
<tr>
<td>Gomez</td>
<td>40</td>
</tr>
<tr>
<td>Whitney</td>
<td>30</td>
</tr>
</tbody>
</table>

13. What percent of the voters polled chose Whitney in the poll?

A. 15%  C. 25%  E. 40%
B. 20%  D. 30%
14. If the poll is indicative of how the 10,000 registered voters of Sprindale will actually vote in the election, which of the following is the best estimate of the number of votes Lue will receive in the election?

- F. 1,500
- G. 2,500
- H. 4,000
- J. 5,000
- K. 8,000

15. If the information in the table were converted into a circle graph (pie chart), then the central angle of the sector for Gomez would measure how many degrees?

- A. 54°
- B. 72°
- C. 90
- D. 108°
- E. 144°
16. In the square ABCE shown below, D is the midpoint of CE. Which of the following is the ratio of the area of \( \triangle ADE \) to the area of \( \triangle ABD 

F. 1:1  
G. 1:2  
H. 1:3  
J. 1:4  
K. 1:8

17. Which of the following is the slope of a line parallel to the line \( y = \frac{2}{3}x - 4 \) in the standard (x,y) coordinate plane?

A) -4  
B) -3/2  
C) 2  
D) 3/2  
E) 2/3
18. Janelle cut a board 30 long into 2 pieces. The ratio of the lengths of the 2 pieces is 2 : 3. What is the length, to the nearest foot, of the shorter piece?

\[
\frac{2}{5} = \frac{x}{30} \cdot \frac{5}{5} \quad \text{or} \quad \frac{2}{5} = \frac{x}{30} \quad \Rightarrow \quad 5x = 60 \quad \Rightarrow \quad x = 12
\]

F. 5  \quad H. 12  \quad K. 18  
G. 6  \quad J. 15

19. What is the smallest integer greater than \(\sqrt{58}\) ?

\[
\sqrt{49} = 7 \quad \sqrt{64} = 8
\]

A. 4  \quad C. 8  \quad E. 30  
B. 7  \quad D. 10
20. Sergio plans to paint the four walls of his room with one coat of paint. The walls are rectangular, and, according to his measurements, each wall is 10 feet by 15 feet. He will not need to paint the single 3-foot-by-5-foot rectangular window in his room and the 3½-foot-by-7-foot rectangular door. Sergio knows that each gallon of paint covers between 300 and 350 square feet. If only 1-gallon cans are available, which of the following is the minimum number of cans of paint Sergio needs to buy to paint his walls.

F. 1  
G. 2  
H. 3  
J. 4  
K. 5

21. What values of x are solutions for \(x^2 + 2x = 8\) ?

A. -4 and 2  
B. -2 and 0  
C. -2 and 4  
D. 0 and 2  
E. 6 and 8

\((x+4)(x-2)=0\)
22. For all $a > 1$, the expression $\frac{3a^4}{3a^6}$ equals:
   
   F. $\frac{1}{2}$  
   G. $-a^2$  
   H. $a^2$  
   J. $-\frac{1}{a^2}$  
   K. $\frac{1}{a^2}$  

23. If point M has a nonzero x-coordinate and a nonzero y-coordinate and the coordinates have opposite signs, then point M must be located in which of the 4 quadrants labeled below?

   A. I only  
   B. III only  
   C. I or III only  
   D. II or IV only  
   E. I or IV only
24. The fixed costs of manufacturing basketballs in a factory are $1,400.00 per day. The variable costs are $5.25 per basketball. Which of the following expressions can be used to model the cost of manufacturing b basketballs in 1 day?

F. $1,405.25b  
G. $5.25b - $1,400.00  
H. $1,400.00b + $5.25  
J. $14,00.00 - $5.25b  
K. $14,00.00 + $5.25b

25. In the figure below, where \( ABC \sim KLM \), lengths given are in centimeters. What is the perimeter, in centimeters, of \( ABC \)?

(Note: the symbol \( \sim \) means "is similar to")

A. 12  
B. 14  
C. 21 1/2  
D. 35  
E. 71 3/4
26. If \( \sqrt[3]{7} = \sqrt[3]{7} \) is true, then \( a = ? \)

\[
\begin{align*}
F. & \quad 1 \\
G. & \quad 7 \\
H. & \quad \sqrt{7} \\
J. & \quad 21 \\
K. & \quad 49 \\
\end{align*}
\]

27. A hot-air balloon 70 meters above the ground is falling at a constant rate of 6 meters per second while another hot-air balloon 10 meters above the ground is rising at a constant rate of 15 meters per second. To the nearest tenth of a second, after how many seconds will the 2 balloons be the same height above the ground?

\[
\begin{align*}
A. & \quad 8.9 \\
B. & \quad 6.7 \\
C. & \quad 2.3 \\
D. & \quad 0.4 \\
E. & \quad 0.2 \\
\end{align*}
\]
28. A hiking group will go from a certain town to a certain village by van on 1 of 4 roads, from the village to a waterfall by riding bicycles on 1 of 2 bicycle paths, and then from the waterfall to their campsite by hiking on 1 of 6 trails. How many routes are possible for the hiking group to go from the town to the village to the waterfall to their campsite.

F. 6  
G. 12  
H. 24  
J. 48  
K. 220

29. Cube A has an edge length of 2 inches. Cube B has an edge length double that of Cube A. What is the volume, in cubic inches, of Cube B?

A. 4  
B. 8  
C. 16  
D. 32  
E. 64
30. A formula used to compute the current value of a savings account is $A=P(1+R)^n$, where $A$ is the current value; $P$ is the amount deposited; $r$ is the rate of interest for 1 compounding period, expressed as a decimal; and $n$ is the number of compounding periods. Which of the following is closest to the value of a savings account after 5 years if $10,000 is deposited at 4% annual interest compound yearly?

F. $10,400  
G. $12,167  
H. $42,000  
J. $52,000  
K. $53,782