Choose correct answer(s) from the given choices

(1) Red ribbon is not longer than green ribbon. Green ribbon is shorter than blue ribbon. Which ribbon is the longest?
   a. Blue ribbon
   b. Red ribbon
   c. Green ribbon

(2) Lengths of two rods are 12 feet and 8 feet. What is the smallest length that can be measured using either of the rods?
   a. 4 feet
   b. 24 feet
   c. 25 feet
   d. 23 feet

(3) The following table shows the number of comics read by Linda and Jeff in 3 weeks.

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Linda</th>
<th>Jeff</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>8</td>
</tr>
</tbody>
</table>

Which of the following statements is not true?
   a. In the first two weeks Linda read more comics than Jeff.
   b. In the last two weeks Linda and Jeff read the same number of comics.
   c. In the first and last week together Linda read fewer comics than Jeff.
   d. In 3 weeks Linda read fewer comics than Jeff.

(4) Kenneth has 3 pairs of black socks and 8 pairs of red socks. All the socks are in a bag. If Kenneth picks the socks without looking at them, how many socks he has to remove from the bag before he can be sure that he has a pair of red color?
   a. 8
   b. 3
   c. 2
   d. 9
(5) How many months in a year have exactly 30 days?
   a.  6  
   b.  2  
   c.  5  
   d.  4  

Fill in the blanks

(6) If 'a' means '-', 'b' means '÷', 'c' means '+' and 'd' means '×' then
   \[ 3 \ a \ 6 \ b \ 2 \ c \ 14 \ d \ 2 = \underline{\phantom{00000}} \]

(7) Richard rolls a cube in which the letters J, F, L, T, A and C appear on faces 1, 2, 3, 4, 5, and 6, respectively.
   ___
   ___ fraction of letters on the cube are symmetric (either horizontal or vertical).
   ___

(8) The table below shows the number of sweets needed for different number of students.

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Number of sweets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
</tr>
</tbody>
</table>

If each student should get same number of sweets, ___ sweets are needed for 17 students.

(9) The following shape is made of several small cubes. If each small cube is 1 cm × 1 cm × 1 cm, the surface area of the shape is ___ cm².
### Answer the questions

**10** The table below shows the number of chocolates needed for different number of students. If each student should get the same number of chocolates, how many chocolates are needed for 20 students?

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Number of chocolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>
Solutions

(1) a. Blue ribbon

**Step 1**
Red ribbon is not longer than green ribbon that means red ribbon is shorter than green ribbon.

<table>
<thead>
<tr>
<th>Shorter</th>
<th>Longer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red ribbon</td>
<td>Green ribbon</td>
</tr>
</tbody>
</table>

**Step 2**
Green ribbon is shorter than blue ribbon.

<table>
<thead>
<tr>
<th>Shorter</th>
<th>Longer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red ribbon</td>
<td>Green ribbon</td>
</tr>
</tbody>
</table>

**Step 3**
Hence, blue ribbon is the longest ribbon.
(2) b. 24 feet

Step 1
To measure a length using a rod, the length to be measured should be a multiple of the length of the rod.

Step 2
So, a length that can be measured using either of the rods must be a multiple of the lengths (common multiple) of both the rods.

Step 3
Since we need to find the smallest such length, we are looking for the least common multiple (LCM) of the lengths of the two rods.

Step 4
To find the LCM of 12 and 8 we will use the division method.

```
2 | 12, 8
  | 6, 4
2 | 6, 4
  | 3, 2
2 | 3, 2
  | 3, 1
3 | 3, 1
    | 1, 1
```

The LCM is \(2 \times 2 \times 2 \times 3 = 24\)

Step 5
The smallest length that can be measured using either of the rods is 24 feet.
(3)  
**d. In 3 weeks Linda read fewer comics than Jeff.**

**Step 1**  
Let us go by the options.

**Step 2**  
**Option a:** In the first two weeks, Linda read $6 + 9 = 15$ comics, while Jeff read $6 + 7 = 13$ comics. This means Linda read more comics than Jeff. The statement is true.

**Step 3**  
**Option b:** In the last two weeks, Linda read $6 + 9 = 15$ comics, while Jeff read $8 + 7 = 15$ comics. This means Linda and Jeff read the same number of comics. Hence, the given statement is true.

**Step 4**  
**Option c:** In the first and last week together, Linda read $6 + 6 = 12$ comics, while Jeff read $6 + 8 = 14$ comics. This means Linda read fewer comics than Jeff. Hence, the given statement is true.

**Step 5**  
**Option d:** In 3 weeks, Linda read $6 + 9 + 6 = 21$ comics, while Jeff read $6 + 7 + 8 = 21$ comics. This means Linda and Jeff read the same number of comics. Hence, the given statement is false.

**Step 6**  
Hence, statement **d** is not true.

(4)  
**a. 8**

**Step 1**  
Kenneth has 3 pairs of black socks and 8 pairs of red socks. The question says that he picks up the socks without looking at their color.

**Step 2**  
The worst case scenario here would be that he picks up all the black socks first and then the red ones, because after the black one are all picked up, he can be sure that the next sock he picks up is red.

**Step 3**  
The total number of black socks is $3 \times 2 = 6$. After 6 socks, he will have to pick up 2 socks more to be sure that he has a pair of red socks.

**Step 4**  
From the above step, we can say that he will have to pick up $6 + 2 = 8$ socks before he has a pair of red socks.
Step 1
We have been asked to find the number of months in a year which have 30 days.

Step 2
Following months in a year have 30 days:

April : 30 days
June : 30 days
September : 30 days
November : 30 days

Total number of months with 30 days are 4.

Step 3
Hence, there are 4 months in a year with 30 days.
Step 1
Anyone of the two rules (BODMAS and PEMDAS) can be used for simplifying the order of operations.

According to the BODMAS rule, the order of operations is as follows:

- Brackets — ( ), { }, [ ], Bar (Any expression under the bar is treated as if it's inside the bracket)
- Division or Multiplication (from left to right)
- Addition or Subtraction (from left to right)

According to the PEMDAS rule, the order of operations is as follows:

- Parenthesis
- Exponent
- Multiplication or Division (from left to right)
- Addition or Subtraction (from left to right)

Step 2
Let us first replace the values of a, b, c and d with the mathematical symbols they represent to create an expression:

\[3 - 6 \div 2 + 14 \times 2\]

Step 3
Let us now do division. Since \(6 \div 2 = 3\), the expression becomes:

\[3 - 3 + 14 \times 2\]

Step 4
Let us now do multiplication. Since \(14 \times 2 = 28\), the expression becomes:

\[3 - 3 + 28\]

Step 5
Let us now do subtraction, and then addition. We get:

\[3 - 3 + 28 = 28\]
Step 1
Symmetric letters are A, C and T.

Step 2
Asymmetric letters are F, J and L.

Step 3
Total symmetric and asymmetric letters are 6.

Step 4
Now, the fraction of symmetric letters (either horizontal or vertical) on the cube is \( \frac{3}{6} \).

Step 1
Let us look at the table carefully and find some pattern between the number of students and number of sweets needed.

Step 2
We can see that the number of sweets needed is always equal to the number of students multiplied by 5.

Step 3
This means, the number of sweets needed for 17 students is \( 17 \times 5 = 85 \) sweets.
Step 1
The given shape is a cuboid which is made of several small cubes.

Step 2
Since all edges of small cubes are of 1cm, we can easily find the width, height and length of bigger cuboid.

Step 3
Height of cuboid = 1 × 2 = 2 cm.

Step 4
Similarly, width and length will be 5 cm and 4 cm.

Step 5
Surface area of cuboid,
\[ A = 2 \times (\text{width} \times \text{length} + \text{length} \times \text{height} + \text{width} \times \text{height}) \]
\[ \Rightarrow A = 2 \times (5 \times 4 + 4 \times 2 + 5 \times 2) \]
\[ \Rightarrow A = 2 \times 38 \]
\[ \Rightarrow A = 76 \text{ cm}^2 \]

Step 1
Let us look at the table carefully and find some pattern between the number of students and number of chocolates needed.

Step 2
We can see that the number of chocolates needed is always equal to the number of students multiplied by 2.

Step 3
This means, the number of chocolates needed for 20 students is 20 × 2 = 40 chocolates.