Answer the questions

(1) Round each number to nearest tens and find the product.
   \[ 93 \times 77 \times 67 \]

(2) Joel did yoga 13 days ago. He does yoga only on Thursday. What is the day today?

(3) A dog is chasing a mouse.
   The dog starts at 5 m and jumps 2 m every time.
   The mouse starts at 8 m and jumps 1 m every time.
   If they both start at the same time, after how many jumps would the dog reach the mouse?

(4) How many triangles are there in this figure?

Choose correct answer(s) from given choice

(5) If \( \spadesuit \times 6 = \heartsuit \)
   \( \heartsuit - \spadesuit = 150, \)
   then what is the value of \( \heartsuit + \spadesuit \)?
   a. 210  
   b. 270  
   c. 150  
   d. 240

(6) Vandita, Usha, Sulekha and Aditya are playing cards. Vandita and Usha are partners. if Usha is facing east, and Sulekha is sitting on left hand side of Usha. Aditya is facing which direction?
   a. north  
   b. east  
   c. south  
   d. west
(7) Which of the following 2 statements is true
Statement 1 : All rectangles are squares.
Statement 2 : All squares are rectangles.

a. None of these  
   b. Only statement 1
   c. Statements 1 and 2  
   d. Only statement 2

(8) What is the next term in this series?

\[ \frac{1}{4}, \frac{1}{7}, \frac{1}{11}, \frac{1}{16}, \frac{1}{22}, \frac{1}{29}, \ldots \]

a. \( \frac{1}{38} \)  
   b. \( \frac{1}{37} \)
   c. \( \frac{1}{39} \)  
   d. \( \frac{1}{35} \)

(9) The table below shows the number of pencils needed for different number of students. If each student should get same number of pencils, how many pencils are needed for 10 students?

<table>
<thead>
<tr>
<th>Number of Students</th>
<th>Number of pencils</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
</tr>
</tbody>
</table>

a. 30  
   b. 29
   c. 32  
   d. 33

(10) If D > B, B > C and C > A, then which of the following is definitely wrong.

a. A > D  
   b. D > A
   c. B > A  
   d. D > C

(11) There are red and white balls in a bag. Two-fifth of the balls are red. If 13 red and 7 white more balls are added to the bag, which of following is correct?

a. There are more red balls than white balls

b. There are more white balls than red balls

c. Cannot be determined from given information

d. There are same number of red and white balls
Fill in the blanks

(12) If $\begin{array}{c} \triangle \triangle \triangle \triangle \triangle \\ + \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\ = 16, \end{array}$ and $\begin{array}{c} \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\ + \triangle \triangle \triangle \triangle \triangle \\ = 20 \end{array}$

and $\begin{array}{c} \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\ + \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\ = 28 \end{array}$

$\begin{array}{c} \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\ + \triangle \triangle \triangle \triangle \triangle \\ + \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \\ = \Box \end{array}$

(13) When a number is put into the machine below, a different number comes out. If 8 goes in, 3 comes out. If 10 goes in, 5 comes out. If 12 goes in, 7 comes out.

If 14 goes in, _____ should come out?

(14) Find the next number in the sequence.

3, 4, 5, 6, 11, 12, 13, 14, 19, 20, 21, 22, 27, 28, 29, 30, _____

(15) The empty boxes below should have numbers _____ and _____.

\[
\begin{array}{c}
\bigcirc \\
463 \\
\bigcirc \\
471
\end{array}
\]
Answers

(1) 504000
(2) Wednesday
(3) 3 jumps

**Step 1**
After 1st jump, dog will be at 7 and mouse will be at 9

**Step 2**
After 2nd jump, dog will be at 9 and mouse will be at 10

**Step 3**
After 3rd jump, dog will be at 11 and mouse will be at 11

**Step 4**
Therefore, dog will catch mouse in 3 jumps.

(4) 10

**Step 1**
Following triangles are there in this figure

![Diagram of triangles]

**Step 2**
Therefore there are 10 triangles in this figure
Step 1
We have been told that ♠ × 6 = ♥. This means, one heart is same in value as 6 spades.

Step 2
We have also been told that ♥ - ♠ = 150. This means that:
Value of one heart - Value of one spade = 150

In the first step, we learnt that the value of one heart is same as 6 spades.
Combining these two facts, we can say that:
Value of 6 spades - Value of 1 spade = 150

This means, the value of 5 spades = 150.

Step 3
If the value of 5 spades is 150, then the value of one spade will be 5 times less, that is, 150/5 = 30

Step 4
Going back to what we learnt in step 1, the value of one heart = 30 × 6 = 180

Step 5
This means, the value of 1 heart + 1 spade is = 180 + 30 = 210

Step 6
Now the value of ♥ + ♠ is 210.
Step 1
The following picture shows the relation between the four directions:

Step 2
It is given that Usha is facing east. Therefore, she should be sitting as follows,

Step 3
It is also given that Sulekha is sitting on the left hand side of Usha. Therefore, she should be sitting as follows,

Step 4
Since Vandita is Usha’s partner, she should be sitting opposite to Usha. Similarly Aditya is Sulekha’s partner, and he should be sitting opposite to Sulekha.

Step 5
Now, we can see that Aditya is facing the north direction.
**Step 1**
Any quadrilateral with four right angle corner is rectangle.

**Step 2**
A square is a special kind of rectangle, it is one where all the sides have the same length

**Step 3**
Therefore we can say that All squares are rectangles and All rectangles are not square

**Step 4**
Therefore only statement 2 is correct

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**Step 1**
If we look at the numbers in the series \( \frac{1}{4}, \frac{1}{7}, \frac{1}{11}, \frac{1}{16}, \frac{1}{22}, \frac{1}{29}, \ldots \)
we will find that the numerator of all terms in the series is 1 and the difference between the denominators in successive terms is increasing by 1:
7 - 4 = 3
11 - 7 = 4
16 - 11 = 5
22 - 16 = 6
29 - 22 = 7

**Step 2**
The difference between 29 and the denominator of the next term should be 8.

**Step 3**
Thus the next denominator should be 29 + 8 = 37.

**Step 4**
Therefore, the next term of the series is \( \frac{1}{37} \).
(9) a. 30

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

**Step 2**
We can see that the number of pencils needed is always equal to the number of students multiplied by 3.

**Step 3**
This means, the number of pencils needed for 10 students is $10 \times 3 = 30$ pencils.

(10) a. $A > D$

**Step 1**
It is given that $D$ is greater than $B$, and $B$ is greater than $C$. Therefore, we can infer that $D$ too is greater than $C$.

**Step 2**
Now we know that $D$ is greater than $C$, and it is given that $C$ is greater than $A$. Therefore, we can infer that $D$ too is greater than $A$.

**Step 3**
Since $D > A$, the statement $A > D$ is definitely wrong.

(11) c. Cannot be determined from given information

**Step 1**
It is given that two-fifth balls are red and rest are white. Since two-fifth is smaller than half, there are more white balls than red balls.

**Step 2**
Now more red balls are added than white balls.

**Step 3**
There were more white balls than red balls, but now more red balls are added, therefore we cannot determine for sure if there will be more red balls or white balls.

(12) 49
### Step 1

Let's write all pairs of input and output numbers,

- $8 \Rightarrow 3$
- $10 \Rightarrow 5$
- $12 \Rightarrow 7$

### Step 2

If we observe these numbers, we can see that output number is 5 less than the input number.

### Step 3

Same pattern should be followed when number 14 goes in, therefore output number,

\[ = 14 - 5 \]

\[ = 9 \]

### Step 1

Let's observe the boxes where numbers 463 and 471 are written.

- 463 is at 2\textsuperscript{nd} position
- 471 is at 10\textsuperscript{th} position

### Step 2

Difference in their position = $10 - 2 = 8$,
Difference in numbers = $471 - 463 = 8$

### Step 3

From above differences we can infer that each part on this line represents 1.

### Step 4

Therefore number at first position should be,

\[ = 463 - (2 - 1) = 462 \]

### Step 5

Therefore number in first box = 462.

### Step 6

Second missing box is at 7\textsuperscript{th} position.

Number at 7\textsuperscript{th} position = $462 + (7 - 1) = 468$. 