Answer the questions

(1) A bus is travelling with uniform speed in one direction. Following graph shows its position (in km) at two time points. Find its position at 30 minutes.

(2) The graph shows the temperature forecast and the actual temperature of a city on ten days. Find the maximum deviation of actual temperature from the forecast.
(3) The graph below shows the average daily circulation (in thousands) of two newspapers (A and B) for ten years. Find the year when combined average daily circulation of two newspapers was minimum. Also find combined average daily circulation in that year.

Choose correct answer(s) from given choice

(4) The graph below shows the production of cycles (in thousands) of two factories (A and B) for ten years. Find the production of cycles of B in the year when combined production of cycles was maximum.

a. 47 thousands  
b. 48 thousands  
c. 49 thousands  
d. 46 thousands
(5) If you plot following set of points on a graph, which set of points will form a straight line?
   a. (1,1) (3,3) (5,5) (6,6)  
   b. (1,2) (2,3) (4,4) (4,5)  
   c. (0,0) (1,0) (3,3) (4,4) (5,5)  
   d. (2,4) (3,6) (5,11) (6,12)

(6) If point (p, q) lies on the graph of function f, which of following points must also lie in the graph of inverse of f.
   a. (-p, -q)  
   b. (p, q)  
   c. (-q, -p)  
   d. (q, p)

(7) Following chart shows average daily circulation (in thousands) of a newspaper. Assuming trend between data points to be linear, find the average daily circulation for 5th year.

   ![Average Daily Circulation Chart]

   a. 42 thousands  
   b. 46 thousands  
   c. 44 thousands  
   d. 45 thousands

(8) The average temperature in Kolkata is shown over 10 weeks in the graph below. Which week saw the biggest increase in temperature?

   ![Average Temperature Chart]

   a. Week 2  
   b. Week 6  
   c. Week 5  
   d. Week 4
(9) If you draw a straight line passing through points (3, 2) and (1, 4), find the point where line intersects with x axis.
   a. (5,0)  
   b. (4,0)  
   c. (3,0)  
   d. (7,0)

(10) Following chart shows quantity of diesel and its cost. Plot a graph using this data, and find the cost for 110 liters of diesel.

<table>
<thead>
<tr>
<th>diesel (in liters)</th>
<th>Cost (in Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>3200</td>
</tr>
<tr>
<td>100</td>
<td>4000</td>
</tr>
<tr>
<td>120</td>
<td>4800</td>
</tr>
<tr>
<td>140</td>
<td>5600</td>
</tr>
</tbody>
</table>

   a. Rs. 4400  
   b. Rs. 4440  
   c. Rs. 4360  
   d. Rs. 4320

(11) A point whose x-coordinate is zero and y-coordinate is non-zero will lie on which axis?
   a. y axis  
   b. x axis  
   c. Depends on value of y-coordinate  
   d. Cannot be determined

Fill in the blanks

(12) The graph below shows the temperature (in degrees Celsius) over 10 weeks in Lucknow. The maximum range of temperature variation (difference between highest and lowest temperature) is ___ degrees Celsius.
(13) Ria is participating in cycling event. Following chart shows the distance traveled by her in ten hours. The highest speed during an hour = ______ km/hour.

(14) The following graph shows the amount of milk (in liters) that a milkman sold over 10 days. On an average, he sells ______ liters of milk every day.

(15) The graph below shows the temperature (in degrees Celsius) over 10 weeks in Lucknow and Mumbai. The maximum difference in temperature = ______ °C.
Step 1
Let’s draw a line connecting to the given points, as shown below,

Step 2
It is given that bus is travelling with uniform speed in one direction, the given line represents the location of the bus at intermediate times.

Step 3
Now, draw a point on the line at time = 30 minutes.

Step 4
From the point we can observe that the bus is at 20 km at 30 minutes.
**Step 1**

From the given graph we can find temperatures of ten days as shown in the table below,

<table>
<thead>
<tr>
<th>Number of day</th>
<th>Actual temperature of the city</th>
<th>Temperature forecast of the city</th>
<th>Deviation in the temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>34</td>
<td>33</td>
<td>33 - 34 = -1</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>32</td>
<td>32 - 33 = -1</td>
</tr>
<tr>
<td>3</td>
<td>33</td>
<td>32</td>
<td>32 - 33 = -1</td>
</tr>
<tr>
<td>4</td>
<td>34</td>
<td>35</td>
<td>35 - 34 = 1</td>
</tr>
<tr>
<td>5</td>
<td>38</td>
<td>37</td>
<td>37 - 38 = -1</td>
</tr>
<tr>
<td>6</td>
<td>36</td>
<td>36</td>
<td>36 - 36 = 0</td>
</tr>
<tr>
<td>7</td>
<td>36</td>
<td>37</td>
<td>37 - 36 = 1</td>
</tr>
<tr>
<td>8</td>
<td>38</td>
<td>36</td>
<td>36 - 38 = -2</td>
</tr>
<tr>
<td>9</td>
<td>36</td>
<td>37</td>
<td>37 - 36 = 1</td>
</tr>
<tr>
<td>10</td>
<td>37</td>
<td>39</td>
<td>39 - 37 = 2</td>
</tr>
</tbody>
</table>

**Step 2**

From the given table we notice that the maximum deviation in the temperature is $2^\circ\text{C}$. 
Step 1
The x-axis and y-axis of the graph represents the year and the average daily circulation of two newspapers respectively.

Step 2
The one small box of chart represents 1 thousands average daily circulation. The combined average daily circulation of two newspapers from 1st year to 10th year are shown in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Newspaper A</th>
<th>Newspaper B</th>
<th>Combined average daily circulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
<td>24</td>
<td>15 + 24 = 39</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>22</td>
<td>13 + 22 = 35</td>
</tr>
<tr>
<td>3</td>
<td>16</td>
<td>22</td>
<td>16 + 22 = 38</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
<td>20</td>
<td>13 + 20 = 33</td>
</tr>
<tr>
<td>5</td>
<td>18</td>
<td>25</td>
<td>18 + 25 = 43</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>23</td>
<td>12 + 23 = 35</td>
</tr>
<tr>
<td>7</td>
<td>17</td>
<td>20</td>
<td>17 + 20 = 37</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
<td>22</td>
<td>18 + 22 = 40</td>
</tr>
<tr>
<td>9</td>
<td>15</td>
<td>22</td>
<td>15 + 22 = 37</td>
</tr>
<tr>
<td>10</td>
<td>13</td>
<td>25</td>
<td>13 + 25 = 38</td>
</tr>
</tbody>
</table>

Step 3
From the given chart we notice that the combined average daily circulation of two newspapers in 4th year was minimum. The combined average daily circulation in 4th year was 33 thousands.
Step 1
The x-axis and y-axis of the graph represents the year and the production of cycles of two factories respectively.

Step 2
The one small box of graph represents 1 thousands production of cycles. The combined production of cycles of two factories from 1st year to 10th year are shown in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Factory A</th>
<th>Factory B</th>
<th>(Factory A + Factory B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>37</td>
<td>42</td>
<td>37 + 42 = 79</td>
</tr>
<tr>
<td>2</td>
<td>35</td>
<td>48</td>
<td>35 + 48 = 83</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
<td>47</td>
<td>40 + 47 = 87</td>
</tr>
<tr>
<td>4</td>
<td>35</td>
<td>42</td>
<td>35 + 42 = 77</td>
</tr>
<tr>
<td>5</td>
<td>38</td>
<td>48</td>
<td>38 + 48 = 86</td>
</tr>
<tr>
<td>6</td>
<td>36</td>
<td>43</td>
<td>36 + 43 = 79</td>
</tr>
<tr>
<td>7</td>
<td>40</td>
<td>44</td>
<td>40 + 44 = 84</td>
</tr>
<tr>
<td>8</td>
<td>35</td>
<td>43</td>
<td>35 + 43 = 78</td>
</tr>
<tr>
<td>9</td>
<td>41</td>
<td>45</td>
<td>41 + 45 = 86</td>
</tr>
<tr>
<td>10</td>
<td>38</td>
<td>48</td>
<td>38 + 48 = 86</td>
</tr>
</tbody>
</table>

Step 3
From the given chart we notice that the combined production of cycles of two factories in 3rd year was maximum. The production of cycles of B in 3rd year was 47 thousands.

a. (1,1) (3,3) (5,5) (6,6)

b. (q, p)

Since (p, q) lies on graph of f, f(p) = q
Hence $f^{-1}(q) = p$
Therefore point (q, p) will lie on the graph of function $f^{-1}$
Step 1

x-axis and y-axis of the chart represents the year and the average daily circulation of a newspaper respectively.

Step 2

It is given that the trend between data points to be linear. We can connect the points as following to find average daily circulation for intermediate years,

Step 3

From the above chart we notice that, the average daily circulation for 5th year is 44 thousands.
Step 1

The y-axis and x-axis of the graph show the temperature over 0 to 9 weeks in Kolkata respectively.

Step 2

If we look at the graph, we notice that the temperature in 3\textsuperscript{rd} week = 20

The temperature in 4\textsuperscript{th} week = 26

Now, the increase in temperature from 3\textsuperscript{rd} week to 4\textsuperscript{th} week = 26 - 20 = 6

Step 3

The increase in temperature from 3\textsuperscript{rd} week to 4\textsuperscript{th} week is 6, which is biggest increase in temperature over 9 weeks and hence, we can say that the \textbf{week 4} saw the biggest increase in temperature. A quick way to find the week with the biggest increase in temperature is to find the line segment in the graph which has highest upward slope. In this graph, the line with the highest upward slope is seen connecting 3\textsuperscript{rd} week to 4\textsuperscript{th} week: that is the segment representing the week 4.

(9) a. (5,0)

(10) a. Rs. 4400
(a) y axis

**Step 1**
We know that, if the x-coordinate of a point is zero, then it lies on the y-axis and if the y-coordinate of a point is zero, then it lies on the x-axis.

**Step 2**
Following graph shows some points whose x-coordinate is zero and y-coordinate is non-zero.

**Step 3**
Thus, the statement "A point whose x-coordinate is zero and y-coordinate is non-zero will lie on the x-axis" is False.
Step 1
The y-axis and x-axis of the graph show the temperatures over 0 to 10 weeks in Lucknow respectively.

Step 2
If we look at the graph, we notice that the temperature is highest in the 2\textsuperscript{nd} week, i.e. 28 °C, and the temperature is lowest in the 0\textsuperscript{th} week, i.e. 21 °C.

Step 3
Now, the difference between highest and lowest temperatures = 28 - 21 = 7 °C

Step 4
Therefore, the maximum range of variation is 7 °C.
Step 1

The y-axis of the graph shows the distance traveled by Ria, whereas the and x-axis shown time from time=0 hours to time=10 hours. Total number of hours is 10.

Step 2

If we look at the graph, we notice that, the distance traveled by Ria in 1\textsuperscript{st} hour = 20 km
The distance traveled by Ria in 2\textsuperscript{nd} hour = 40 - 20 = 20 km
The distance traveled by Ria in 3\textsuperscript{rd} hour = 50 - 40 = 10 km
The distance traveled by Ria in 4\textsuperscript{th} hour = 50 - 50 = 0 km
The distance traveled by Ria in 5\textsuperscript{th} hour = 70 - 50 = 20 km
The distance traveled by Ria in 6\textsuperscript{th} hour = 70 - 70 = 0 km
The distance traveled by Ria in 7\textsuperscript{th} hour = 80 - 70 = 10 km
The distance traveled by Ria in 8\textsuperscript{th} hour = 90 - 80 = 10 km
The distance traveled by Ria in 9\textsuperscript{th} hour = 90 - 90 = 0 km
The distance traveled by Ria in 10\textsuperscript{th} hour = 100 - 90 = 10 km.

Step 3

Now, the highest distance traveled by Ria in an hour is 20 km, the highest speed during an hour is 20 km/hour.
Step 1
The y-axis of the graph represents the amount of milk sold by the milkman over 10 days, where days are shown on x-axis

Step 2
From the graph we can observe that, the milk sold over 1\textsuperscript{st} to 10\textsuperscript{th} day are 14, 11, 15, 12, 16, 10, 12, 15, 11, 14 liters respectively.

Step 3
The average liters of milk sold by him per day = \[
\frac{\text{Total milk sold in 10 days}}{10}
\]
\[
= \frac{14 + 11 + 15 + 12 + 16 + 10 + 12 + 15 + 11 + 14}{10}
\]
\[
= \frac{130}{10}
\]
\[
= 13 \text{ liters}
\]
**Step 1**
The x-axis and y-axis of the graph represents the week and temperature respectively.

**Step 2**
One small box in chart represents 1°C temperature. The difference in temperatures from 1\textsuperscript{st} week to 10\textsuperscript{th} week are shown in the following table:

<table>
<thead>
<tr>
<th>Week</th>
<th>Lucknow temperature (in degrees Celsius)</th>
<th>Mumbai temperature (in degrees Celsius)</th>
<th>Difference in temperature (Mumbai temperature - Lucknow temperature)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25</td>
<td>39</td>
<td>39 - 25 = 14</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>35</td>
<td>35 - 30 = 5</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td>35</td>
<td>35 - 27 = 8</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
<td>33</td>
<td>33 - 24 = 9</td>
</tr>
<tr>
<td>5</td>
<td>27</td>
<td>36</td>
<td>36 - 27 = 9</td>
</tr>
<tr>
<td>6</td>
<td>27</td>
<td>33</td>
<td>33 - 27 = 6</td>
</tr>
<tr>
<td>7</td>
<td>26</td>
<td>37</td>
<td>37 - 26 = 11</td>
</tr>
<tr>
<td>8</td>
<td>26</td>
<td>38</td>
<td>38 - 26 = 12</td>
</tr>
<tr>
<td>9</td>
<td>28</td>
<td>34</td>
<td>34 - 28 = 6</td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td>33</td>
<td>33 - 24 = 9</td>
</tr>
</tbody>
</table>

**Step 3**
From the given chart we notice that the difference in temperature in 1\textsuperscript{st} week is maximum.
The difference in temperature in 1\textsuperscript{st} week is 14°C.