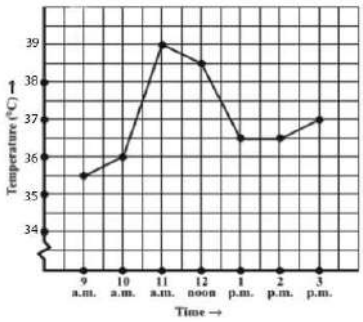
#463134



The following graph shows the temperature of a patient in a hospital, recorded every hour.

(a) What was the patient's temperature at 1 p.m.?

(b) When was the patient's temperature $38.5^{\circ}C$?

(c) The patient's temperature was the same two times during the period given.

What were these two times?

(d) What was the temperature at 1.30 p.m.? How did you arrive at your answer?

(e) During which periods did the patient's temperature showed an upward trend?

Solution

In the graph $x-$axis represents the time and $y-$axis represents the temperature of the patient.

Scale :

On $x-$axis 1 cm $= 1$ hr

On $y-$axis 1 cm $= 1\ ^{0}C$

Steps:

1) To find the temperature at particular time:

Trace the vertical line parallel to $y-$axis passing from the time point on $x-$axis, find the point where this vertical line intersects the graph.

Now from that point trace a horizontal line parallel to x-axis, this line intersects the $y-$axis at required point.

2) To find the time at particular temperature:

Trace the horizontal line parallel to $x-$axis passing from the temperature point on $y-$axis, find the point where this horizontal line intersects the graph.

Now from that point trace a vertical line parallel to $y-$axis, this line intersects the $x-$axis at required point.

Now,

a) Follow step 1 to find temperature corresponding to time 1 pm, you get point between 36 to 37 which is $36.5^{0}C$

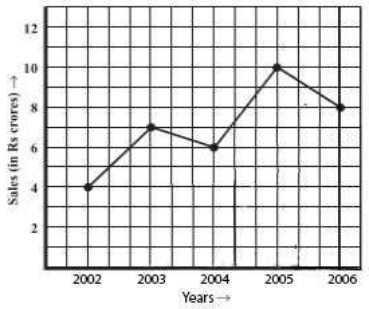
b) Follow step 2 from point between $38-39$ i.e. $38.5^{0}C$, we get corresponding point on $x-$axis which is 12 noon.

c) In the graph we see $36.5^{0}C$ is the temperature which is same. Follow step 2 to get corresponding times which is 1 pm and 2 pm.

d) temperature at $1:30$ pm is $36.5^{0}C$, since we know from (c) temperature is same between interval 1 pm to 2 pm.

e) To show upward trend graph continues with positive slope, we have $9-10, 10-11$ and $2-3$ time interval where slope is positive. so patient's temperature showing upwa trend in $9-11$ am and $2-3$ pm interval.

#463138



The following line graph shows the yearly sales figures for a manufacturing company.

(a) What were the sales in (i) 2002 (ii) 2006?

(b) What were the sales in (i) 2003 (ii) 2005?

(c) Compute the difference between the sales in 2002 and 2006.

(d) In which year was there the greatest difference between the sales as compared to its previous year?

Solution

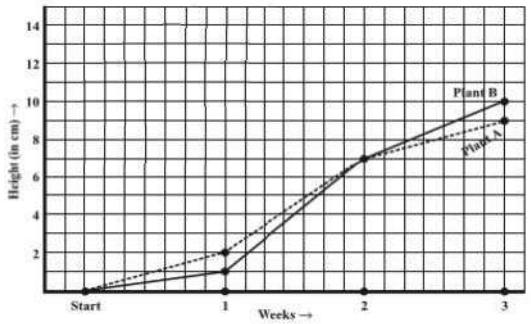
a) In 2002, it was Rs 4 crores and in 2006, it went to Rs 8 crores

b) In 2003, sales was Rs. 7 crores and in 2005, it was Rs 10 crores

c) Difference in sales between 2002 and 2006 is Rs 4 crores

d) 2005

#463147



For an experiment in Botany two different plants, plant A and plant B were grown under similar laboratory conditions. The heights were measured at the end of each week for weeks. The results are shown by the following graph.

(a) How high was Plant A after (i) 2 weeks (ii) 3 weeks?

(b) How high was Plant B after (i) 2 weeks (ii) 3 weeks?

(c) How much did Plant A grow during the 3^{rd} week?

(d) How much did Plant B grow from the end of the $2nd$ week to the end of the $3rd$ week?

(e) During which week did plant A grow most?

(f) During which week did plant B grow least?

(g) Were the two plants of the same height during any week shown here? Specify.

Solution

In the graph $x-$axis represents weeks and $y-$axis represents the heights of the plant.

Scale :

On $x-$axis 7 cm $=1$ week

On $y-$axis 1 cm $=1$ cm in height

To find the height of plant at particular week:

Trace the vertical line parallel to $y-$axis passing from the point on $x-$axis, find the point where this vertical line intersects the graph.

Now from that point trace a horizontal line parallel to $x-$axis, this line intersects the $y-$axis at required point.

To find the week at particular height:

Trace the horizontal line parallel to $x-$axis passing from the height point on y-axis, find the point where this horizontal line intersects the graph.

Now from that point trace a vertical line parallel to $y-$axis, this line intersects the $x-$axis at required point.

Now,

a) Follow step 1 on graph for plant A at point i) 2 weeks and ii) 3 weeks, we get corresponding heights on $y-$ axis, 7 cm for 2 weeks and 9 cm for 3 weeks.

b) Follow step 1 on graph for plant B at point i) 2 weeks and ii) 3 weeks, we get corresponding heights on $y-$ axis, 7 cm for 2 weeks and 10 cm for 3 weeks.

c) To find grow during 3^{rd} week, we have to find the height difference between 2^{nd} and 3^{rd} week, which is 9 cm -7 cm $=2$ cm

d) To find grow of plant B from end of 2^{nd} week to end of 3^{rd} week, we have to find height difference between 3^{rd} and 2^{nd} week, 10 cm -7 cm $=3$ cm

e) Find the grow of height level of plant A weekwise

1^{st} week: 1 cm -0 cm $=1$ cm

2^{nd} week: 7 cm -1 cm $=6$ cm

3^{rd} week: 9 cm -7 cm $=2$ cm

so plant A grows on 2^{nd} week the most

f) Find the grow of plant B week-wise

1^{st} week: 2 cm -0 cm $=2$ cm

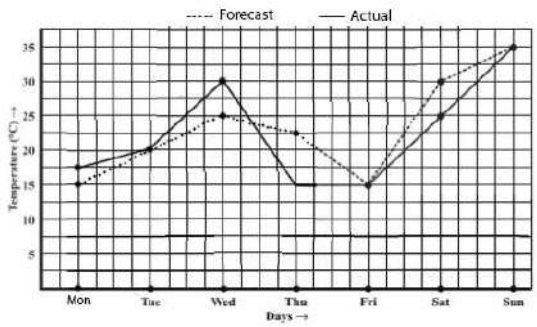
2^{nd} week: 7 cm -2 cm $=5$ cm

3^{rd} week: 10 cm -7 cm $=3$ cm

so plant B grow least on week 1^{st}

g) Graphs of plant A and plant B intersects at (2^{nd} week and 7 cm height), so plants were in same height which is 7 cm.

#463149



The following graph shows the temperature forecast and the actual temperature for each day of a week.

(a) On which day was the forecast temperature the same as the actual temperature?

(b) What was the maximum forecast temperature during the week?

(c) What was the minimum actual temperature during the week?

(d) On which day did the actual temperature differ the most from the forecast temperature?

Solution

We have two graphs actual and forecast, In the graph $x-$axis represents days and $y-$axis represents the temperature

Scale :

On $x-$axis 4 cm $= 1$ day

On $y-$axis 2 cm $= 5^0C$

To find the temperature at particular day:

Trace the vertical line parallel to $y-$axis passing from the point on $x-$axis, find the point where this vertical line intersects the graph.

Now from that point trace a horizontal line parallel to $x-$axis, this line intersects the $y-$axis at required point.

To find the day at particular temperature:

Trace the horizontal line parallel to $x-$axis passing from the temperature point on $y-$axis, find the point where this horizontal line intersects the graph.

Now from that point trace a vertical line parallel to $y-$axis, this line intersects the $x-$axis at required point.

Now,

a) Forecast temperature and actual temperature are same where the graphs of both intersects which is Tuesday, Friday and Sunday

b) Follow step 1 to find temperature for graph forecast on days of week,

Mon -15^0C

Tue -20^0C

Wed -25^0C

Thu -22.5^0C

Fri -15^0C

Sat -30^0C

Sun -35^0C

So, maximum forecast temperature during the week is 35^0C

c) Follow step 1 to find temperature for actual graph on days of week

Mon-17.5^0C

Tue -20^0C

Wed-30^0C

Thu -15^0C

Fri -15^0C

Sat -25^0C

Sun -35^0C

So, minimum actual temperature during the week is 15^0C

d) Difference between actual and forecast temperatures during the week

Mon, $17.5 - 15 = 2.5^0C$

Tue, $20 - 20 = 0^0C$

Wed, $30 - 25 = 5^0C$

Thu, $15 - 22.5 = -7.5^0C$

Fri, $15 - 15 = 0^0C$

Sat, $25 - 30 = -5^0C$

Sun, $35 - 35 = 0^0C$

So, actual temperature differ most from forecast temperature is 7.5^0C which is on Thursday.

#463159

Use the tables below to draw linear graphs.

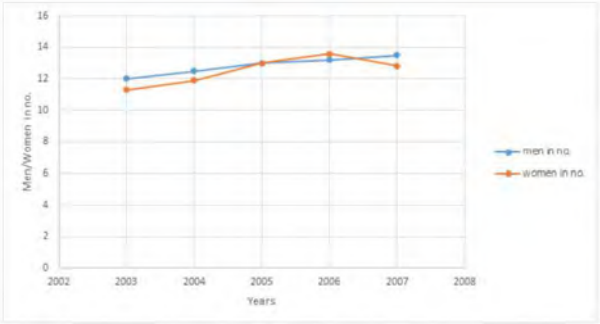
(a) The number of days a hill side city received snow in different years.

Year	2003	2004	2005	2006
Days	8	10	5	12

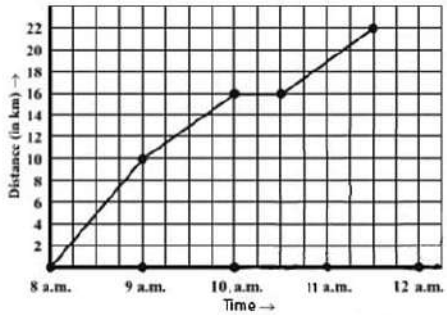
(b) Population (in thousands) of men and women in a village in different years.

Year	2003	2004	2005	2006	2007
Men in no.	12	12.5	13	13.2	13.5
Women in no.	11.3	11.9	13	13.6	12.8

Solution



#463163



A courier-person cycles from a town to a neighbouring suburban area to deliver a parcel to a merchant. His distance from the town at different times is shown by the following graph.

(a) What is the scale taken for the time axis?

(b) How much time did the person take for the travel?

(c) How far is the place of the merchant from the town?

(d) Did the person stop on his way? Explain.

(e) During which period did he ride fastest?

Solution

In the graph $x-$axis represents the time period and $y-$axis represents the distance traveled by the courier person.

Scale :

On $x-$axis 4 cm $=1$ hr

On $y-$axis 1 cm $=2$ km

To find the distance at particular time:

Trace the vertical line parallel to y-axis passing from the time point on x-axis, find the point where this vertical line intersects the graph.

Now from that point trace a horizontal line parallel to x-axis, this line intersects the y-axis at required point.

To find the time at particular distance:

Trace the horizontal line parallel to x-axis passing from the distance point on y-axis, find the point where this horizontal line intersects the graph.

Now from that point trace a vertical line parallel to y-axis, this line intersects the x-axis at required point

Now,

a) 4 cm $=1$ hr

b) Graph is starting from 0 km to 22 km, which means travelling distance is 22 km, so time taken is difference between time when person is on 0 km and when person is on 22 km, follow step 1 to find out time corresponding to distance, we get $11:30-8=3:30$hr.

c) Since courier person is starting from 0 km and ending at 22 km, so the place of merchant is 22 km far from the town.

d) If we see the graph, there is a time interval from $10:00$ am to $10:30$ am when the distance covered is same i.e. 16 km, so yes the person did stop on his way.

e) We know that Speed $=\dfrac{\text{Distance}}{\text{Time}}$

we have same time interval which is 1 hr, so speed is directly proportional to distance covered.

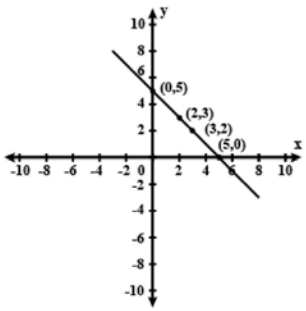
Distance covered in time interval 8 am to 9 am is more person ride fastest during 8 am to 9 am period.

#463313

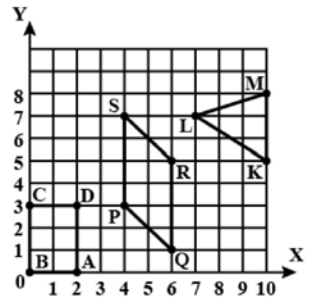
Draw the line passing through $(2,\ 3)$ and $(3,\ 2)$. Find the coordinates of the points at which this line meets the x-axis and y-axis.

Solution

The line which passes through $(3,2)$ and $(2,3)$ cuts the $x-$axis at $(5,0)$ and $y-$axis at $(0,5)$.



#463314



Write the coordinates of the vertices of each of these adjoining figures.

Solution

For the rectangle : $A(2, 0)$; $B(0, 0)$; $C(0, 3)$; $D(2, 3)$

For the parallelogram PQRS: $P(4, 3)$; $Q(6, 1)$; $R(6, 5)$; $S(4, 7)$

For the triangle KLM : $K(10, 5)$; $L(7, 7)$; $M(10, 8)$

#463315

State whether True or False. Correct that are false.

(i) A point whose x coordinate is zero and y-coordinate is non-zero will lie on the y-axis.

(ii) A point whose y coordinate is zero and x-coordinate is 5 will lie on y-axis.

(iii) The coordinates of the origin are $(0,\ 0)$

Solution

i) $y-$axis coordinates are given by $(0, y)$, $x-$coordinate is always zero for the point which is lying on $y-$axis, so statement is True.

ii) As explained above for a point to be on $y-$axis, its $x-$ coordinate must be zero, so the statement is false

Correct statement: A point whose y coordinate is zero and $x-$ coordinate is 5 will lie on $x-$axis.

iii) Origin is the point where both x and y coordinates are zero, so statement is True.

#463316

Draw the graphs for the following tables of values, with suitable scales on the axes.

(a) Cost of apples

Number of apples	1	2	3	4	5
Cost (in Rs.)	5	10	15	20	25

(b) Distance travelled by a car

Time (in hours)	6am	7am	8am	9am
Distance (in km)	40	80	120	160

(i) How much distance did the car cover during the period 7.30 a.m. to 8 a.m?

(ii) What was the time when the car had covered a distance of 100 km since it's start?

(c) Interest on deposits for a year.

Deposit (in Rs.)	1000	2000	3000	4000	5000
Simple Interest (in Rs.)	80	160	240	320	400

(i) Does the graph pass through the origin?

(ii) Use the graph to find the interest on $Rs.2500$ for a year.

(iii) To get an interest of $Rs.280$ per year, how much money should be deposited?

Solution

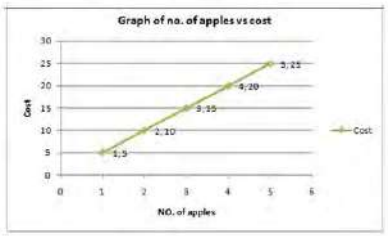
b) i) 20 km

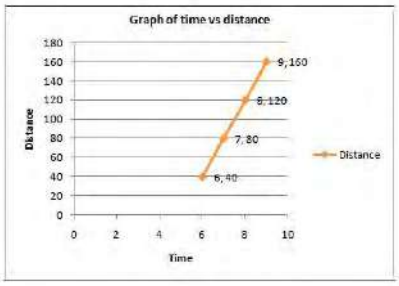
ii) 7.30 am

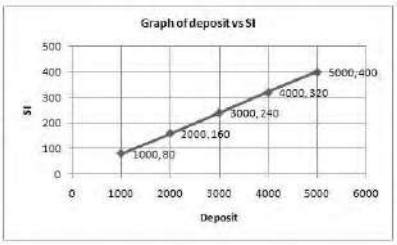
c) i) The graph is linear and it passes through the origin.

ii) Interest on Rs. 2500 is Rs. 200.

iii) To get an interest of Rs. 280 per year, she must deposit Rs. 3500.







#463317

Draw a graph for the following.

i)

Side of square (in cm)	2	3	3.5	5	6
Perimeter (in cm)	8	12	14	20	24

Is it a linear graph?

(ii)

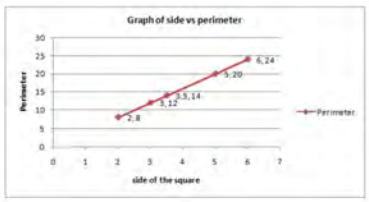
Side of square (in cm)	2	3	4	5	6
Perimeter (in cm)	4	9	16	25	36

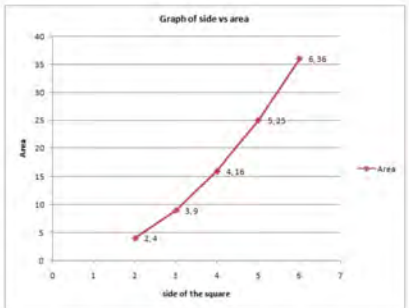
Is it a linear graph?

Solution

(i) it is a linear graph as the line is a straight line.

(ii) It is not linear as the graph is a curve and is not a straight line.





#463601

Draw the graph of each of the following linear equations in two variables:

(i) $x + y = 4$

(ii) $x - y = 2$

(iii) $y = 3x$

(iv) $3 = 2x + y$

Solution

(i) $x + y = 4$

x	0	1	4
y	4	3	0

(ii) $x - y = 2$

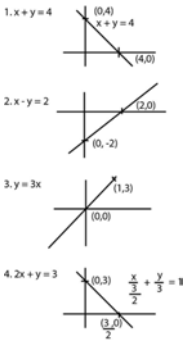
x	2	3	0
y	0	1	-2

(iii) $y = 3x$

x	0	1	-1
y	0	3	-3

(iv) $2x + y = 3$

x	0	1	$\frac{3}{2}$
y	3	1	0



#463605

If the point $(3, 4)$ lies on the graph of the equation $3y = ax + 7$, find the value of a.

Solution

$3y = ax + 7$

As given $x = 3$ and $y = 4$

Put the value in the equation

$\implies 3 \times 4 = a \times 3 + 7$

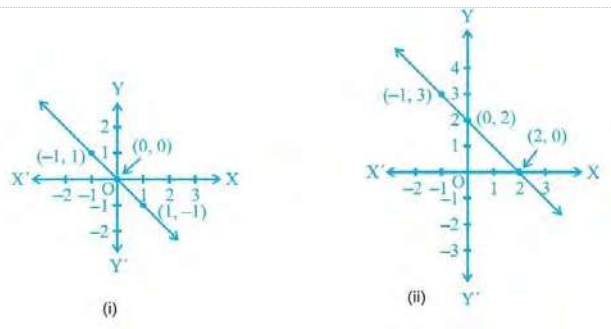
$\implies 12 = 3a + 7$

$\implies 3a = 12 - 7$

$\implies 3a = 5$

$\implies a = \frac{5}{3}$

#463607



From the choices given below, choose the equation whose graphs are given in Fig. (i) and Fig. (ii).

For fig. (i)	For fig. (ii)
(i) $y = x$	(i) $y = x + 2$
(ii) $x + y = 0$	(ii) $y = x - 2$
(iii) $y = 2x$	(iii) $y = -x + 2$
(iv) $2 + 3y = 7x$	(iv) $x + 2y = 6$

Solution

In the given fig. (i), the solutions of the equation are $(-1, 1), (0, 0)$ and $(1, -1)$.

$\therefore$ the equation which satisfies these solutions is the correct equation.

Equation (ii) $x + y = 0$, satisfies these solutions.

Proof:

If we put the value of $x = -1$ and $y = 1$ in the equation $x + y = 0$

$= x + y = -1 + 1 = 0$

$\therefore L.H.S = R.H.S$

if we put the the value of x = 0 and y = 0

$= x + y = 0 + 0 = 0$

$\therefore L.H.S = R.H.S$

If we put the value of $x = 1$ and $y = -1$

$= x + y = 1 + (-1) = 1 - 1 = 0$

$L.H.S = R.H.S$

Hence, option (ii) $x + y = 0$ is correct.

In the given Fig.(ii) the solutions of the equation are $(-1, 3), (0, 2)$ and $(2, 0)$.

$\therefore$ The equation which satisfies these solutions is the correct equation.

Equation (iii) $y = -x + 2$, satisfies these solutions.

Proof:

If we put the value of $x = -1$ and $y = 3$ in the equation $y = -x + 2$

$y = -x + 2$

$3 = -(-1) + 2$

$3 = 3$

$\therefore L.H.S = R.H.S$

if we put the the value of $x = 0$ and $y = 2$

$y = -x + 2$

$2 = -0 + 2$

$2 = 2$

$\therefore L.H.S = R.H.S$

If we put the value of $x = 2$ and $y = 0$

$y = -x + 2$

$0 = -2 + 2$

$0 = 0$

$L.H.S = R.H.S$

Hence, option (iii) $y = -x + 2$ is correct.

#463616

In countries like USA and Canada, temperature is measured in Fahrenheit, whereas in countries like India, it is measured in Celsius. Here is a linear equation that converts Fahrenheit to Celsius:

$$F = \left(\frac{9}{5}\right) C + 32$$

(i) Draw the graph of the linear equation above using Celsius for x-axis and Fahrenheit for y-axis.

(ii) If the temperature is 30^oC, what is the temperature in Fahrenheit?

(iii) If the temperature is 95^oC, what is the temperature in Celsius?

(iv) If the temperature is 0^oC, what is the temperature in Fahrenheit and if the temperature is 0^oF, what is the temperature in Celsius?

(v) Is there a temperature which is numerically the same in both Fahrenheit and Celsius? If yes, find it.

Solution

(i) Since the equation between F and C is given, the graph can be drawn between them.

(ii) Given $c = 30$, so $F = \frac{9}{5} \times 30 + 32 = 86\ F$

(iii) Given $F = 95$, so $C = \frac{5}{9} \times (F - 32) = 35\ C$

(iv) Given $C = 0$, so $F = 32$ and if $F = 0$, we get $C = -\frac{160}{9}$.

(v) Put $F = C = x$ in given equatin, we get $\frac{4x}{5} = -32$, from which we get $x = -40$

Yes, there is a temperature which is numerically the same in both fahrenheit and celsius, the numerical value is -40.

#463617

Give the geometric representations of $y = 3$ as an equation

(i) in one variable

(ii) in two variable

Solution

(i) $y = 3$

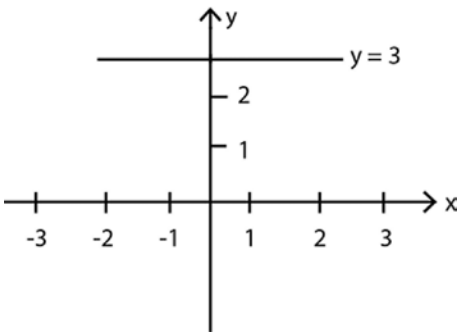
(ii) $y = 3$

$\Rightarrow 0x + y = 3$

$\Rightarrow 0x + y - 3 = 0$

which is in fact $y = 3$

It is a line parallel to x-axis at a positive distance of 3 from it. We have two of its solution as $(0, 3), (1, 3)$.



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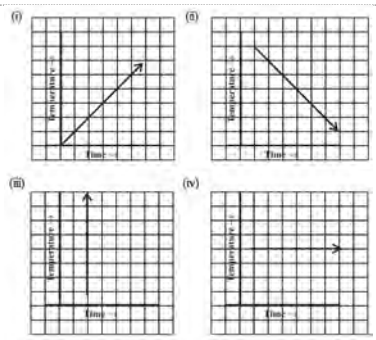

Can there be a time-temperature graph as follows? Justify your answer.

Solution

i) Yes, this type of time-temperature graph is possible.

As time increases, temperature also increases.

ii) Yes, this type of time-temperature graph is possible.

As time increases, temperature decreases.

iii) No, this type of time-temperature graph is not possible.

Here, time is constant, which is not possible and temperature increases,

iv) Yes, this type of time-temperature graph is possible.

As time increases, temperature is constant..

Lets take an example of daily life.

As the time increases,

(i) Time from morning to noon, temperature increases.

(ii) Time from Noon to evening, temperature decreases.

(iv) Time during the noon or in night, temperature can remain constant.

But,

(iii) Temperature cannot increase if the time is constant.

Therefore, (iii) is not possible.