

SOLVED EXAMPLES

1. If the length of a wooden board is 7 m. Express this height in centimetre.

Solution

Length of wooden board = 7 m

$$1 \text{ m} = 100 \text{ cm}$$

$$7 \text{ m} = 7 \times 100 \text{ cm} = 700 \text{ cm}$$

Hence, the length of wooden board is 700cm.

2. If the length of your science book is 35 cm. Express this length in metre.

Solution

Length of science book = 35 cm

$$1 \text{ m} = 100 \text{ cm}$$

$$\Rightarrow \frac{1}{100} \text{ m} = 1 \text{ cm} \Rightarrow 1 \text{ cm} = \frac{1}{100} \text{ m}$$

$$\Rightarrow 35 \text{ cm} = 35 \times \frac{1}{100} \text{ m} = 0.35 \text{ m}$$

Hence, the length of science book in metre is 0.35 m.

3. If the length of a cloth is 2 metre. Convert this length in millimetre.

Solution

Length of the cloth = 2 metre

$$1 \text{ m} = 1000 \text{ mm}$$

$$2 \text{ m} = 2 \times 1000 \text{ mm} = 2000 \text{ mm}$$

Hence, the length of the cloth is 2000 mm.

4. How many metre is in 2000 mm?

Solution

$$1 \text{ mm} = \frac{1}{1000} \text{ m}$$

$$2000 \text{ mm} = 2000 \times \frac{1}{1000} \text{ m} = 2 \text{ m}$$

Hence, the answer is 2 metre.

5. The distance between Kota and Delhi is 518 km. Express this distance in metre.

Solution

Distance between Kota to Delhi=518 km.

$$1 \text{ km} = 1000 \text{ metre}$$

$$518 \text{ km} = 518 \times 1000 \text{ metre}$$

$$= 518000 \text{ metre}$$

Hence, distance between Kota to Delhi is 518000 metre.

6. If the distance between your school and your home is 4.5 km. Express this in metre.

Solution

Distance between school and home= 4.5 km.

$$1 \text{ km} = 1000 \text{ metre}$$

$$4.5 \text{ km} = 4.5 \times 1000 \text{ metre} = 4500 \text{ metre}$$

Hence, distance between school and home is 4500 m.

7. Convert 25 cm into millimetre.

Solution

$$1 \text{ cm} = 10 \text{ mm}$$

$$25 \text{ cm} = 25 \times 10 \text{ mm} = 250 \text{ mm}.$$

Hence 25 cm is equal to 250 mm.

8. If the length of a rice grain is 10 mm. What will be its length in cm.

Solution

Length of a rice grain = 10 mm

$$1 \text{ mm} = 10 \times \frac{1}{10} \text{ cm}.$$

$$10 \text{ mm} = 10 \times \frac{1}{10} \text{ cm} = 1 \text{ cm}$$

Hence, length of a rice grain is 1 cm.

9. If the height of your friend is 128 cm.

Express this height in metre.

Solution

Height of friend = 128 cm

$$1 \text{ cm} = \frac{1}{100} \text{ metre}$$

$$\text{therefore } 128 \text{ cm} = 128 \times \frac{1}{100} \text{ metre}$$

$$= \frac{128}{100} \text{ metre}$$

$$= 1.28 \text{ m.}$$

Hence, the height of friend is 1.28 m.

10. Convert 25 km into metre.

Solution

$$1 \text{ km} = 1000 \text{ m.}$$

therefore 25 km

$$= 25 \times 1000 \text{ m}$$

$$= 25000 \text{ m}$$

Hence the answer is 25000 m.

NCERT QUESTIONS WITH SOLUTIONS

1. Some lengths are given in column I of Table. Some units are given in column II. Match the lengths with the units suitable for measuring those lengths.

	Column I		Column II
(A)	Distance between Delhi and Lucknow	(p)	Centimetre
(B)	Thickness of a coin	(q)	Kilometre
(C)	Length of an eraser	(r)	Metre
(D)	Length of school ground	(s)	Millimetre

Solution

(A → q); (B → s); (C → p); (D → r)

2. Read the following statements and mark True (T) or False (F) against each.

- (i) The motion of a car moving on a straight road is an example of linear motion.
- (ii) Any object which is changing its position with respect to a reference point with time is said to be in motion.

(iii) 1 km = 100 cm

Solution

- (i) True
- (ii) True
- (iii) False

3. Which of the following is not a standard unit of measuring length?

- (i) millimetre
- (ii) centimetre
- (iii) kilometre
- (iv) handspan

Solution

handspan

4. Search for the different scales or measuring tapes at your home and school. Find out the smallest value that can be measured using each of these scales. Record your observations in a tabular form.

Solution

We can find wooden ruler, plastic ruler, measuring tape, etc. The smallest value that we can record is 'mm'.

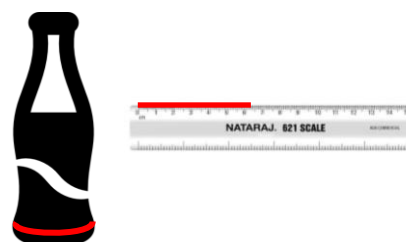
5. Suppose the distance between your school and home is 1.5 km. Express it in metres.

Solution

$$1.5 \text{ km} = 1000 \text{ m} + 500 \text{ m} \\ = 1500 \text{ m}$$

6. Take a tumbler or a bottle. Measure the length of the curved part of the base of glass or bottle and record it.

Solution



Length of the curved part of the base of glass bottle = 6.35 cm = 2.5 inch

7. Measure the height of your friend and express it in (i) metres (ii) centimetres and (iii) millimetres.

Solution

Suppose height is 5 feet 2 inches

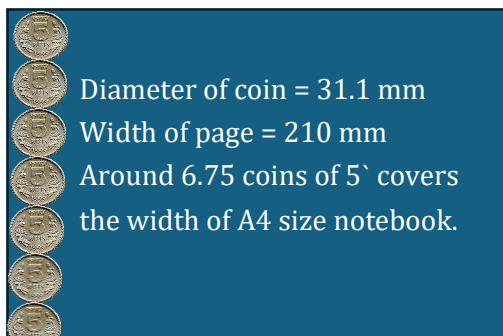
Then, in mm = 1574.8 mm

in cm = 157.48 cm

in m = 1.5748 m

8. You are given a coin. Estimate how many coins are required to be placed one after the other lengthwise, without leaving any gap between them, to cover the whole length of the chosen side of a notebook. Verify your estimate by measuring the same side of the notebook and the size of the coin using a 15-cm scale.

Solution



9. Give two examples each of linear, circular and oscillatory motion.

Solution

Linear motion → (i) Car moving on a straight road.

(ii) Airplane flying in the sky

Circular motion → (i) Athlete running on a circular track.

(ii) Motion of moon around earth.

Oscillatory motion → (i) Motion of a swing.

(ii) Motion of a pendulum.

10. Observe different objects around you. It is easier to express the lengths of some objects in mm, some in cm and some in m. Make a list of three objects in each category and enter them in the table.

Table : Sizes of objects around us

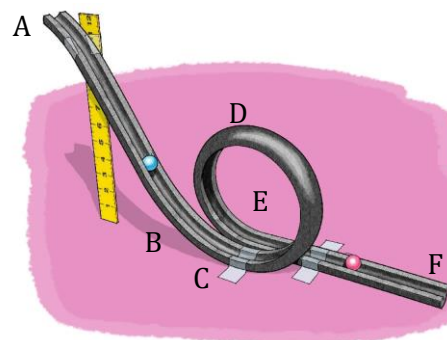
Size	Objects
mm	
cm	
m	

Solution

We can select many objects from around such as allen module, floor tiles, clothes line etc.

Size	Objects
mm	Floor tiles
cm	Allen module
m	Clothes line

11. A rollercoaster track is made in the shape shown in figure. A ball starts from point A and escape through point F. Identify the types of motion of the ball on the rollercoaster and corresponding portions of the track.



Solution

A to B → linear motion

B to C to D to E → Circular/curvilinear motion.

E to F → linear motion.

12. Tasneem wants to make a metre scale by herself. She considers the following materials for it : plywood, paper, cloth, stretchable rubber and steel. Which of these should she not use and why?

Solution

She must not use stretchable rubber because if any such scale is used, overtime the measurement will be changed or vary.

13. Think, design and develop a card game on conversion of units of length to play with your friends.

Solution

You can make as many as cards possible to play with your friends.

The one who gets the correct answer will get a small reward such as extra slice of pizza, etc.

For example

Sample Challenge Cards:**Card 1:**

Front: "Convert 1.5 kilometers to meters."

Back: "1.5 kilometers = 1500 meters."

Card 2:

Front: "Convert 50 miles to kilometers."

Back: "50 miles = 80.4672 kilometers."

Card 3:

Front: "Convert 25 centimeters to inches."

Back: "25 centimeters = 9.8425 inches."

Card 4:

Front: "Convert 5000 millimeters to meters."

Back: "5000 millimeters = 5 meter"

EXERCISE-01

Multiple choice questions

1. You are about to express height of K2 Mountain. You will express it in. **PLM054**
 (1) m (2) cm
 (3) mm (4) km
2. The height ten metres is equal to **PLM055**
 (1) 100 cm (2) 100000 mm
 (3) 1000 cm (4) 1000 dm
3. One-thousandth is expressed by which prefix? **PLM056**
 (1) Centi (2) Milli
 (3) Kilo (4) deci
4. The fixed quantity of measurement is called **PLM057**
 (1) Foot (2) Unit
 (3) Pound (4) Meter
5. While measuring length using a metre scale, the position of the eye **PLM058**
 (1) Should be vertically above the zero mark of the scale.
 (2) Should be vertically above the point where the measurement is to be taken.
 (3) Should be exactly at the point where the measurement is to be taken.
 (4) Does not matter as long as the scale is accurate.
6. You are about to help your P.T. teacher uses to measure the length of a playground with **PLM059**
 (1) Elastic tape (2) Ruler
 (3) Tape scale (4) Body parts
7. Which type of unit of length will be used to find thickness of a coin? **PLM060**
 (1) km (2) metre
 (3) millimetre (4) centimetre
8. Which device can be used to measure length of curved line? **PLM061**
 (1) Metre scale (2) Elastic tape
 (3) Thread and ruler (4) None of these
9. One of the early measure of distance was **PLM062**
 (1) litre (2) kilogram
 (3) hand span (4) gram
10. Which of the following statements is not valid for both rotational and circular motion? **PLM063**
 (1) Rotation about an axis passing through the body.
 (2) Body moves and changes position with respect to time.
 (3) Body stays in the same place with respect to time.
 (4) To and fro motion of a body about its mean position.
11. Which of these is dissimilar or different from the others? **PLM064**
 (1) A car taking turn on a curved road
 (2) Motion of a swing
 (3) Motion of needle end of a sewing machine
 (4) Motion of an engine piston



12. An example of rotational motion is

PLM065

- (1) The Moon revolving around the Earth.
- (2) The Earth rotating about its own axis.
- (3) The Earth revolving around the Sun.
- (4) The bob of a swinging pendulum.

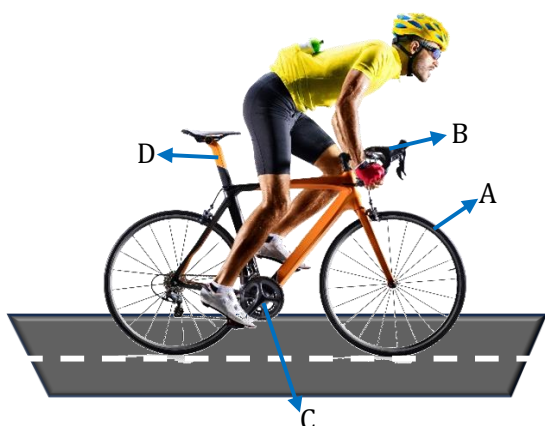
13. In which of the following motion, there is no change in the direction of movement of the body?

PLM066

- (1) Rotational motion
- (2) Rectilinear motion
- (3) Periodic motion
- (4) All of the above

14. Which part of the moving cycle undergoes rotational motion?

PLM067



- (1) Only A
- (2) A and B
- (3) A and C
- (4) B and D

15. What kind of motion does a pendulum have?

PLM068



- (1) Periodic motion
- (2) Rectilinear motion
- (3) Rotational motion
- (4) Non-periodic motion

16. Motion of which of the following is not periodic?

PLM069

- (1) Beating of a drum by a drummer
- (2) Rotation of the Earth on its axis
- (3) Revolution of Moon around the Earth
- (4) Movement of a pendulum

17. The motion of the arms of soldiers taking part in march past is

PLM070

- (1) Circular motion
- (2) Periodic motion
- (3) Rotational motion
- (4) Rectilinear motion

18. An example of rectilinear motion is

PLM071

- (1) Apple falling from a tree
- (2) Motion of a car on road
- (3) A spinning top
- (4) Both (1) and (2)

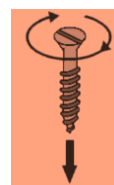
19. Motion of the Earth is

PLM072

- (1) Circular motion
- (2) Periodic motion
- (3) Rotational motion
- (4) All the three types

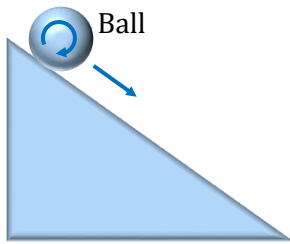
20. Motion of a screw while going into the wood is an example of

PLM073



- (1) Rectilinear and circular motion
- (2) Rotation and revolution
- (3) Rotation and spin motion
- (4) Rotational and rectilinear motion

21. The motion exhibited by the ball rolling down an inclined plane is : **PLM074**



- (1) Rotational and circular
(2) Rotational and periodic
(3) Linear and rotational
(4) Uniform motion
22. What kind of motion is executed by a pendulum of a wall clock? **PLM075**
- (1) Rectilinear motion
(2) Periodic motion
(3) Circular motion
(4) (1) and (2) Both
23. Windmill shows _____ motion. **PLM076**



- (1) Rotational (2) Circular
(3) Linear (4) None of these
24. Which of the following does not involve combination of motion? **PLM077**
- (1) A car (2) A bicycle
(3) Spinning top (4) Rolling ball
25. Earliest mode of transport on water was **PLM078**
- (1) Aeroplane
(2) Yacht
(3) Logs tied together
(4) Bullock cart

True or false

- We can understand a measurement even without a unit. **PLM079**
- The standard unit of length is centimetre in metric system. **PLM080**
- A standard unit is always a fixed measure of a physical quantity. **PLM081**
- The choice of a length-measuring device depends upon the type of measurement to be made. **PLM082**
- Kilometre is used for measuring small distances. **PLM083**
- We can trust on the measurements taken by use our senses and body parts. **PLM084**
- A body is said to be in motion only if its position changes with time. **PLM085**
- The motion of the seconds hand of a clock is rotational. **PLM086**
- The motion of the ball in a game of football is linear. **PLM087**
- The motion of the Moon around the Earth can be considered as a circular motion. **PLM088**

1. **Match the column** **PLM089**

Column-I		Column-II	
(1)	10^{-1}	(a)	Milli
(2)	10^{-2}	(b)	Deci
(3)	10^{-3}	(c)	Centi
(4)	10^1	(d)	Deca

2. Match the column **PLM090**

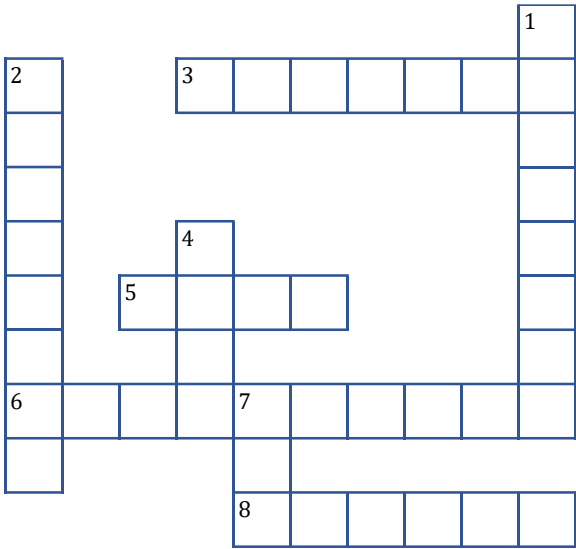
Column-I		Column-II	
(1)	A motion that repeats itself in regular intervals of time.	(a)	Circular motion
(2)	A motion in which an object moves in a fixed direction	(b)	Rotational motion
(3)	An athlete moving on circular track.	(c)	Rectilinear motion
(4)	Motion of ceiling fan.	(d)	Periodic motion

Fill in the blanks

- The determination of the size or magnitude of something is called _____. **PLM092**
- Five kilometre is _____ m. **PLM093**
- An object is said to be in motion if its _____ changes with time. **PLM094**
- In rectilinear motion objects move along _____ path. **PLM095**
- Motion of a child on a swing is _____. **PLM096**
- An object in _____ motion moves about an axis. **PLM097**
- Motion of wheel of a bicycle is _____. **PLM098**
- Any type of motion that repeat itself after equal intervals of time is called _____. **PLM099**
- To measure the diameter of a tree, you can use _____. **PLM100**
- Rotation of the Earth about its axis is a _____ motion but it is _____ an oscillatory motion. **PLM101**

1. Crossword

PLM102



Across

3. _____ system consist of measurement of length consists of units yard, feet, inch, mile etc.
5. An object is said to be at _____ if its position does not change with time.
6. A spinning top exhibit _____ motion
8. Measurement consists of _____ and unit.

Down

1. _____ quantity is the building blocks of physics.
2. _____ units are Internationally accepted.
4. $10^6 =$ _____
7. One centimetre is equal to _____ millimetre.

ANSWER KEY

Multiple choice questions

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	1	3	2	2	2	3	3	3	3	4	1	2	2	3	1
Question	16	17	18	19	20	21	22	23	24	25					
Answer	1	2	4	4	4	3	2	1	3	3					

True or false

- | | | | | |
|----------|----------|---------|----------|----------|
| 1. False | 2. False | 3. True | 4. True | 5. False |
| 6. False | 7. True | 8. True | 9. False | 10. True |

Match the column

1. (1) → (b), (2) → (c), (3) → (a), (4) → (d)
2. (1) → (d), (2) → (c), (3) → (a), (4) → (b)

Fill in the blanks

- | | | | |
|-----------------------|-------------------|--------------------------------------|-------------|
| 1. Measurement | 2. 5000 | 3. Position | 4. Straight |
| 5. Oscillatory motion | 6. Rotational | 7. Rotational motion + Linear motion | |
| 8. Periodic motion | 9. Measuring tape | 10. Periodic; not | |

Crossword puzzle

										¹ P
² S				³ E	N	G	L	I	S	H
T										Y
A										S
N				⁴ M						I
D				⁵ R	E	S	T			C
A					G					A
⁶ R	O	T	A	⁷ T	I	O	N	A	L	
D					E					
				⁸ N	U	M	B	E	R	

EXERCISE-02

Very short answers type questions

1. Define measurement. **PLM103**
2. Define unit. **PLM104**
3. What is the SI unit of length? **PLM105**
4. Give three example where length can be measured in metre. **PLM106**
5. Which type of metre scale is used by the tailor to measure length? **PLM107**
6. Name the measuring device you can use to measure the girth of a tree. **PLM108**
7. Arrange following in increasing order : 1 km, 5 cm, 10 mm, 4 m **PLM109**
8. Give two examples of periodic motion.
9. What kind of movement does the Earth have about its axis? **PLM110**
10. Define circular motion of an object with suitable example. **PLM111**
11. Define rotatory motion with a suitable example? **PLM112**
12. Define the term rectilinear motion. **PLM113**
13. What do you understand by term periodic motion? **PLM114**
14. Classify the following as circular, periodic or rectilinear motion : **PLM116**
Swing, Speed boat racing, 100 m race, Rocking chair, The Moon revolving around the Earth.
15. Give one example of modes of transport used on land, water and air. **PLM117**

Short answer type questions

1. What is the need for standard units of measurement? **PLM118**
2. Why could you not use an elastic measuring tape to measure distance? What would be some of the problems you would meet in telling someone about a distance you measured with an elastic tape? **PLM119**
3. Why a cubit can't be used as standard unit of length? **PLM120**
4. How can one measure the length of a curved line? **PLM121**
5. What precautions should be taken while measuring length with a ruler? **PLM122**
6. How did people measure length in early times? **PLM123**
7. Write the similarities and differences between the motion of a bicycle and a ceiling fan that has been switched on. **PLM124**
8. Can an object have more than one type of motion? If yes, give two examples. **PLM125**
9. What is periodic motion? Give any two examples. **PLM126**
10. What is the difference between motion of a falling stone and motion of a stone tied to a thread and whirled with hand? **PLM127**

Long answer type questions

1. Explain, how will you measure the length of a book using a perfect scale. What should you do if the scale is broken at its zero end? Make figure and give an example. **PLM128**
2. Explain in brief the types of motion and give one example of each. **PLM129**

Numerical Problems

1. Arrange the following lengths in their increasing magnitude : **PLM130**
1 metre, 1 centimetre, 1 kilometre, 1 millimetre.
2. Convert : **PLM131**
(a) 250 m to cm (b) 120 m to km
(c) 521 mm to cm (d) 178 km to m
(e) 812 cm to m.
3. Give the metric prefix for each value : **PLM132**
(a) 1000 (b) 0.01
4. The height of a person is 2.25 m. Express it into cm and mm. **PLM133**
5. The distance between Radha's home and her friend's home is 4862 m. Express this distance into km. **PLM134**

ANSWER KEY

Numerical problems

1. 1 mm, 1 cm, 1 m, 1 km
2. (a) 25000 cm (b) 0.12 km (c) 52.1 cm (d) 178000 m (e) 8.12 m
3. (a) Kilo (b) Centi
4. 225 cm ; 2250 mm
5. 4.862 km

