Section A: Circumference

Short-answer questions

Specific instructions to students

- This section is designed to help you to both improve your measuring skills and to increase your speed in measuring the circumference of a round object.
- Read the following questions and answer all of them in the spaces provided.
- You may not use a calculator.
- You will to show all of your working out.

\[ C = \pi \times d \]

where:
- \( C \) = circumference
- \( \pi \) = 3.14
- \( d \) = diameter

**EXAMPLE**

Find the circumference of a wheel with a diameter of 30 cm.

\[ C = \pi \times d \]

Therefore, \( C = 3.14 \times 30 \)

\[ = 94.2 \text{ cm} \]

**QUESTION 1**

Find the circumference of a wheel with a diameter of 200 cm.

**Answer:**

628 cm

**QUESTION 2**

Calculate the circumference of a pulley with a diameter of 15 cm.

**Answer:**

47.1 cm

**QUESTION 3**

Find the circumference of a headlight with a diameter of 32 cm.

**Answer:**

100.48 cm

**QUESTION 4**

Determine the circumference of the head of an inlet valve with a diameter of 5 cm.

**Answer:**

15.7 cm

**QUESTION 5**

Calculate the circumference of a distributor cap with a diameter of 30 cm.

**Answer:**

94.2 cm

**QUESTION 6**

Find the circumference of a front brake disc with a diameter of 28.8 cm.

**Answer:**

90.43 cm
QUESTION 7
Determine the circumference of a speaker with a diameter of 45.6 cm.

Answer:
143.18 cm

QUESTION 8
Find the circumference of a 1200 watt (W) sander with a diameter of 14.3 cm.

Answer:
44.90 cm

QUESTION 9
Calculate the circumference of a brake drum with a diameter of 42.9 cm.

Answer:
134.71 cm

QUESTION 10
Find the circumference of a 500 W sub woofer with a diameter of 18.8 cm.

Answer:
59.03 cm

Section B: Diameter

Short-answer questions

Specific instructions to students

• This section is designed to help you to both improve your measuring skills and to increase your speed in measuring the diameter of a round object.
• Read the following questions and answer all of them in the spaces provided.
• You may not use a calculator.
• You need to show all of your working out.

Example

Diameter (d) of a circle = \( \frac{\text{circumference}}{\pi} \)

Find the diameter of a brake disc with a circumference of 110 cm.

\[
d = \frac{110}{3.14} = 35.03 \text{ cm}
\]

QUESTION 1
Find the diameter of a steering wheel with a circumference of 120 cm.

Answer:
38.22 cm

QUESTION 2
Calculate the diameter of an exhaust silencer with a circumference of 16 cm.

Answer:
5.10 cm

QUESTION 3
Find the diameter of a lamp unit with a circumference of 20 cm.

Answer:
6.37 cm

QUESTION 4
Determine the diameter of a 600 W sub woofer with a circumference of 130 cm.

Answer:
41.40 cm

QUESTION 5
Calculate the diameter of a tyre with a circumference of 210 cm.

Answer:
66.88 cm

QUESTION 6
Find the diameter of an alloy wheel lock nut with a circumference of 11.8 cm.

Answer:
3.76 cm
QUESTION 7
Calculate the diameter of a radiator hose with a circumference of 12.4 cm.

Answer:
3.95 cm

QUESTION 8
Find the diameter of a brake disc with a circumference of 90.8 cm.

Answer:
28.92 cm

QUESTION 9
Determine the diameter of an air filter with a circumference of 100 cm.

Answer:
31.85 cm

QUESTION 10
Find the diameter of an oil filter with a circumference of 32.8 cm.

Answer:
10.45 cm

Section C: Area

Short-answer questions
Specific instructions to students
• This section is designed to help you to both improve your measuring skills and to increase your speed in measuring surface area.
• Read the following questions and answer all of them in the spaces provided.
• You may not use a calculator.
• You need to show all of your working out.

Area = length × width and is given in square units.

= l × w

QUESTION 1
The length of the inside of a box trailer is 30 m by 2.8 m wide, what is the total area?

Answer:
84 m²

QUESTION 2
If a workshop measures 60 m by 13 m, what is the total area?

Answer:
780 m²

QUESTION 3
A sheet of fibreglass is 2.85 m by 1.65 m. What is the total area?

Answer:
4.7 m²
QUESTION 4
If a car hoist is 4.5 m by 1.8 m, what is the total area?

Answer:
8.1 m²

QUESTION 5
Gasket material can be purchased by the square metre. What is the total area of a 30 m roll that is 1.50 m wide?

Answer:
45 m²

Section D: Volume of a cube

Short-answer questions

Specific instructions to students

• This section is designed to help you to both improve your measuring skills and to increase your speed in calculating volumes of rectangular or square objects.
• Read the following questions and answer all of them in the spaces provided.
• You may not use a calculator.
• You need to show all of your working out.

Volume = length × width × height and is given in cubic units.

= l × w × h

QUESTION 1
How many cubic metres are there in a storage area 13 m by 5 m by 4 m?

Answer:
260 m³

QUESTION 2
If a recovery truck has the dimensions of 8 m by 3 m by 4 m, how many cubic metres are available?

Answer:
96 m³
QUESTION 3
A box trailer used for transporting drag racing cars is 38 m long by 3 m high by 6 m wide. How many cubic metres are there?

Answer:
684 m³

QUESTION 4
If a welder constructs a small trailer 2.2 m by 1.8 m by 0.5 m, how many cubic metres are available?

Answer:
1.98 m³

QUESTION 5
A mechanic’s assistant makes a new tool box with the following dimensions: 600 mm by 150 mm by 100 mm. How many cubic millimetres have been made?

Answer:
9 000 000 mm³

QUESTION 6
A MIG welder stands 1.2 m x 0.6 m x 0.5 m. What cubic area does it take up?

Answer:
0.36 m³

Section E: Volume of a cylinder

Short-answer questions
Specific instructions to students
• This section is designed to help you to both improve your measuring skills and to increase your speed in calculating volumes of cylindrical objects.
• Read the following questions and answer all of them in the spaces provided.
• You may not use a calculator.
• You need to show all of your working out.

Volume of a cylinder \(V_c = \pi \times r^2 \times h\)

QUESTION 1
What is the volume of a drum that has a radius of 10 cm and a height of 50 cm?

Answer:
15 700 cm³

QUESTION 2
What is the volume of a can of degreaser that has a radius of 3 cm and a height of 20 cm?

Answer:
565.2 cm³

QUESTION 3
A canister of axle grease has a radius of 4 cm and a height of 11 cm. What is its volume?

Answer:
552.64 cm³

QUESTION 7
A spare parts box is 1 m long, 60 cm wide and 75 cm tall. How many cubic centimetres are available for storing parts?

Answer:
450 000 cm³

QUESTION 8
The boot of a people carrier is 1.4 m wide x 1.6 m long x 88 cm high. What is its cubic area in centimetres?

Answer:
1 971 200 cm³

QUESTION 9
A panel beater works on a panel van that is 1.75 m high by 1.35 m wide by 3.6 m long. What is its total volume in cubic metres?

Answer:
8.51 m³

QUESTION 10
A paint sprayer needs to spray a room 3.8 m x 3.8 m x 2.5 m. How many cubic metres does he need to cover?

Answer:
36.1 m³
QUESTION 4

An oil can has a radius of 5 cm and a length of 28 cm. How much grease can it hold?

Answer:
2198 cm³

QUESTION 5

A can of lock oil has a radius of 5 cm and a height of 16.5 cm. What is its volume?

Answer:
1295.25 cm³

QUESTION 6

A mechanic has a can of degreaser that has a radius of 3 cm and a height of 25 cm. What is its volume?

Answer:
235.5 cm³

QUESTION 7

A 5 l container of anti-freeze gets poured into three containers. Each container has a radius of 5 cm and a height of 20 cm.

a What is the volume of each container?

Answer:
1570 cm³

b What is the volume of all three containers in total?

Answer:
4710 cm³

c How much is left in the 5 litre container?

Answer:
290 cm³

QUESTION 8

A container of body filler has a radius of 10 cm and a height of 15 cm.

a What is its volume?

Answer:
4710 cm³

b If you use half on one job, how much is left?

Answer:
2355 cm³

QUESTION 9

A can of general purpose thinners has a radius of 11 cm and a height of 22 cm.

a What is its volume?

Answer:
8358.68 cm³

b If you use 750 cm³, how much is left?

Answer:
7608.68 cm³

QUESTION 10

A panel beater uses a can of body filler that has a radius of 6 cm and a height of 18 cm. What is its volume?

Answer:
2034.72 cm³