

Easy-learn Maths Grade 7B

Chapter 1. Circles

Measure radius and diameter	1
Radius and Diameter	4
Circumference of Circles	5
Area of Circles	9

Chapter 2. Graphs

Pie Charts	28
Understanding Pie Charts	32
Construction of Pie Charts	32
Challenging Problems on Pie Charts	36

Chapter 3. Volume and Area

Volume of Cuboids or Rectangular Prisms	41
Volume of Liquids in Rectangular Prisms	47
Filling a Rectangular Tank	55

Chapter 4. Average

Average	59
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Chapter 5. Speed and Rate

Speed	67
Average Speed	74
Meeting half-way	79
Rate	82

Chapter 6. Fractions

Whole Numbers	84
Simplifying Fractions and Equivalent Fractions	85
Mixed Numbers and Improper Fractions	86
The Four Operations with Fractions	87
Fraction of Units	89
More Fractions	91
Fraction Problems	94
More Challenging Problems on Fractions	97

Chapter 7. Revision

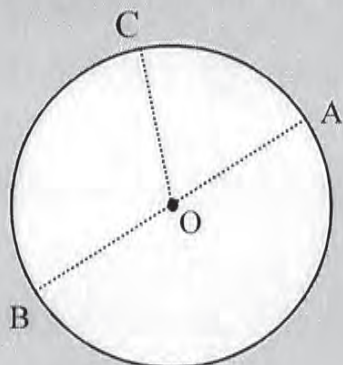
Test Paper 1	102
Test Paper 2	115
Test Paper 3	129
More Test Questions	144

Answers and Solutions

Answers (6 pages)	147
Solutions to questions marked with * (22 pages)	153

Chapter 1. Circles

We need to use a pair of compass to draw a circle.

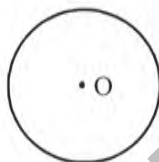


O is the centre of the circle.
OA is a radius of the circle.
OB, OC are also radii (plural of radius) of the circle. BA is the diameter.
It is a straight line passing through centre O.
The diameter is twice the length of the radius.
In mathematical language, we say:
Diameter = 2 x radius
 $BA = 2 \times OA$ or $BA = 2 \times OC$



Set 1A. Measure the radius and diameter of each circle. O is the centre.

1.



radius = _____ cm

diameter = _____ cm

2.



radius = _____ cm

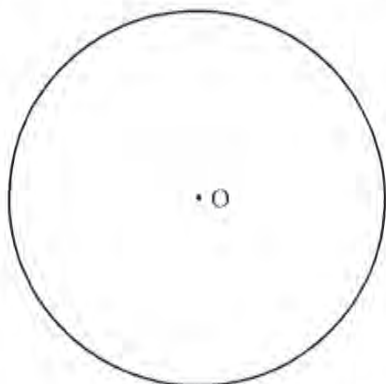
diameter = _____ cm



Circles

Set 1A. Measure the radius and diameter of each circle.

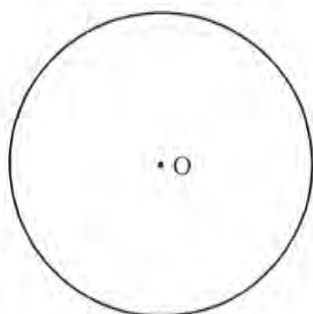
3.



radius = _____ cm

diameter = _____ cm

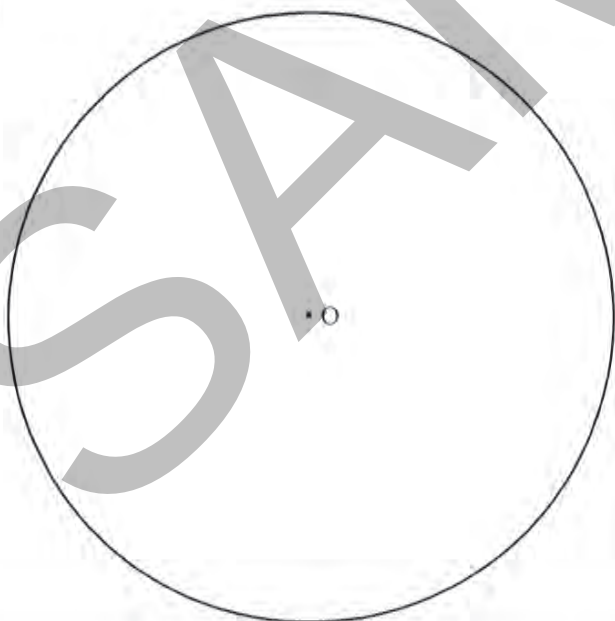
4.



radius = _____ cm

diameter = _____ cm

5.



radius = _____ cm

diameter = _____ cm

Circles

Set 1A.

6. Use a pair of compass and draw circles with the following measurements.

(Ask your parent or teacher to check for you.)

(a) radius = 2.5 cm

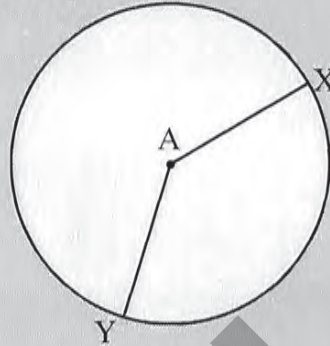
(b) radius = 3 cm

(c) diameter = 8 cm

Circles

Radius and Diameter

To reiterate, a radius is a straight line from the centre of the circle to the side of the circle, which is also known as the circumference. If A is the centre of this circle, then AX and AY are radii (plural of radius).



A diameter is a straight line joining two points on the circumference and passing through the centre of the circle.

If O is the centre, then CD is a diameter.

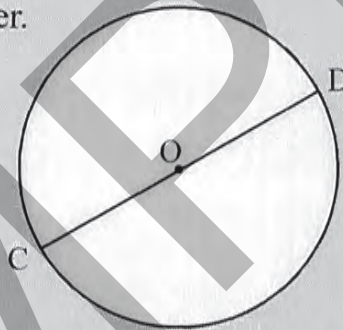
$$OD = OC \text{ (radii)}$$

$$CD = OC + OD$$

$$\text{diameter} = 2 \times \text{radius}$$

$$\text{diameter} = 2 \times \text{radius}$$

$$\text{radius} = \text{diameter} \div 2$$



Example: In the table below, fill in the empty boxes.

Circle	Radius (r)	Diameter(d)
A	6 cm	
B	3 cm	
C		20 cm
D		22 cm

$$\longrightarrow d = 2r = 2 \times 6 = \underline{12 \text{ cm}}$$

$$\longrightarrow d = 2r = 2 \times 3 = \underline{6 \text{ cm}}$$

$$\longrightarrow r = d \div 2 = 20 \div 2 = \underline{10 \text{ cm}}$$

$$\longrightarrow r = d \div 2 = 22 \div 2 = \underline{11 \text{ cm}}$$

Which of the above is the biggest circle? The circle with the radius 11 cm.

Which of the above is the smallest circle? The circle with the radius 3 cm.

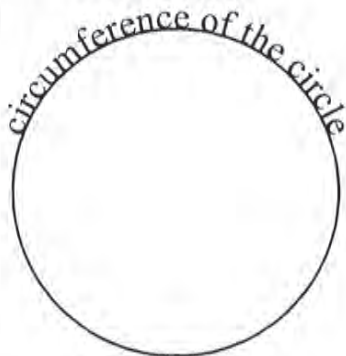
Circles

Radius and Diameter

Set 1B. Fill in the spaces in the table below.

Circle	Radius	Diameter
A	1 cm	
B	5 cm	
C	7 cm	
D		8 cm
E		18 cm
F		28 cm

Circumference



The circumference is the perimeter of the circle.



Set 1C.

Draw circles on sheets of paper with the following diameters.

Then use string to carefully measure the circumference of each circle (*this is not easy*); record the length of each measurement with the corresponding diameter. (Give length to nearest 0.5 cm).

Now divide the circumference by the diameter. (You may use a calculator.)

Write your answer in column 4.

Round off your answer to the nearest 2 decimal places.

Circle	Diameter (d)	Circumference (c)	Column 4 ($c \div d$)
P	4 cm		
Q	5 cm		
R	6 cm		
S	7 cm		
T	8 cm		

Circles

Circumference of Circle

What did you notice in column 4?

We get a constant number quite close to 3.14.
This means that the circumference of the
circle is approximately 3.14 times the diameter
i. e. $C \div 3.14 d$.



This constant is known as π (pi). The actual value of π has been calculated to thousands of decimal places.

A very good approximation for π , often used is $\frac{22}{7}$ ($= 3.1428571....$)

This wonderful mathematical discovery was made by Greek mathematician *Archimedes* in year 230 B.C. (Before Christ).

Circumference of Circle

$$\text{Circumference} = \pi \times \text{diameter}$$

$$\text{Circumference} = \pi \times 2 \times \text{radius}$$

Example 1: The diameter of the circle is 40 cm. Find its circumference. (Take $\pi = 3.14$)

$$\begin{aligned}\text{Circumference of circle} &= \pi \times d \\ &= 3.14 \times 40 \\ &= 125.6 \text{ cm}\end{aligned}$$

Example 2: The radius of a circle is 14 cm. Find its circumference. (Take $\pi = \frac{22}{7}$)

$$\begin{aligned}\text{Circumference of circle} &= 2 \times \pi \times r \\ &= 2 \times \frac{22}{7} \times 14 \\ &= 88 \text{ cm}\end{aligned}$$

Circles

Circumference of Circle

Example 3: The circumference of a circle is 44 cm. Find its radius and diameter.
(Take $\pi = \frac{22}{7}$)

Method 1

Circumference of circle = $2 \times \pi \times r$

$$44 = 2 \times \frac{22}{7} \times r$$

$$44 \div \frac{44}{7} = r$$

$$r = 44 \times \frac{7}{44}$$

$$r = 7 \text{ cm}$$

Radius is 7 cm and diameter is 14 cm.

Method 2

$$C = 2 \times \pi \times r$$

$$44 = 2 \times \frac{22}{7} \times r$$

$$44 = \frac{44r}{7}$$

$$7 \times 44 = 44r$$

$$\text{i.e. } \frac{7 \times 44}{44} = r$$

$$\text{i.e. } r = 7 \text{ cm}$$

Radius is 7 cm and diameter is 14 cm.

Set 1D.

1. Calculate the circumference of the circle of radius 30 cm. (take $\pi = 3.14$)

2. Calculate the circumference of the circle of diameter 56 cm. (take $\pi = \frac{22}{7}$)

Answers to Easy-learn Maths Grade 7B

Chapter 1

Set 1A. (page 1 to 2)

1. 1 cm, 2 cm 2. 3 cm, 6 cm 3. 2.5 cm, 5 cm
4. 2 cm, 4 cm 5. 4 cm, 8 cm

Set 1B. (page 5)

- A. 2 cm B. 10 cm
C. 14 cm D. 4 cm
E. 9 cm F. 14 cm

Set 1C. (page 5)

Answers depend on your measurements for the circumferences of the various circles.

- P 12.5 cm, 3.13
Q 15.5 cm, 3.10
R 19 cm, 3.17
S 22 cm, 3.14
T 25 cm, 3.13

Set 1D. (page 7 to 9)

1. 188.4 cm 2. 176 cm *3. $31\frac{3}{7} \div 31.43$ cm *4. 41.12 cm
5. 198 cm 6. 32.13 cm 7. 66 cm 8. 37.71 cm

Set 1E. (page 13 to 27)

1. 14.13 cm^2 2. 19.625 cm^2
*3(a). $19\frac{1}{4} \text{ cm}^2$ 4(a). 78.5 cm^2
(b). $19\frac{1}{4} \text{ cm}^2$ (b). 21.5 cm^2
(c). 15.7 cm^2
*5. 164.48 cm^2 6. $49\pi - 12\frac{1}{4}\pi = 36\frac{3}{4}\pi \text{ cm}^2$
*7. 49.21 cm^2 , 41.13 cm^2 *8. 76.57 cm^2
*9. 14 cm^2 10. 86 cm^2
11. 59.44 cm^2 12(a). 147 cm^2 (b). 44 cm^2
13(a). $24\pi \text{ cm}^2$ (b). $36\pi \text{ cm}^2$ 14. $147\pi \text{ cm}^2$, 462 cm^2
15. 462 cm^2 16. 508 cm^2
17. 11.5 cm^2 18. $4158 - 693 = 3465 \text{ cm}^2$
19. $38\frac{1}{2} - 24\frac{1}{2} = 14 \text{ cm}^2$ *20. 32 cm^2
*21. $(28 + 14\pi) \text{ cm}^2$ 22. 15.71 cm^2
23(a). 8 cm (b). 201.14 cm^2 *24(a). $100\pi \text{ cm}^2$ (b). 290 cm^2
25. 10 cm *26. $500\pi \text{ cm}^2$
*27. $120\pi \text{ cm}^2$ *28. 545.04 cm^2
29. $33 + 28 + 22 = 83 \text{ cm}$ 30. $28 + 22 = 50 \text{ cm}$
31. 140.96 cm^2 32. 590.02 cm^2
*33. 490 cm^2 *34. 21.5 cm^2
*35. 43 cm^2 *36. $4 \times 57 = 228 \text{ cm}^2$

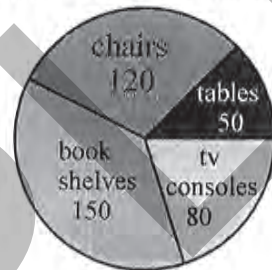
Chapter 2

Set 2A. (page 29 to 31)

- 1(a). Holden (b). 425 (c). 75 (d). Ford, Honda (e). 30%
2. Food = \$1225, Clothing = \$350, Transport = \$700, Savings = \$700

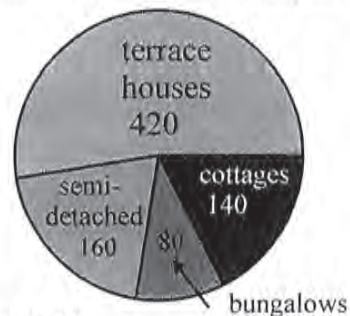
- (a) $\$1225, \frac{1225}{3500}, 35\%$ (b) $\$350, \frac{350}{3500}, 10\%$
(c) $\$700, \frac{700}{3500}, 20\%$ (d) $\$700, \frac{700}{3500}, 20\%$
(e) Food = 35%, Clothing = 10%, Transport = 20%
Savings = 20%

- 3(a). 400 (b). 150, 37.5% (c). tv consoles (d). 20%



4.

terrace houses	420 units	52.5 %
semi-detached	160 units	20 %
bungalows	80 units	10 %
cottages	140 units	17.5 %
total number	800 units	100 %



Set 2B. (page 34 to 35)

- 1(a). lime juice = $\frac{80}{220} = 36\frac{4}{11}\%$
(b). orange juice = $\frac{30}{220} = 13\frac{3}{11}\%$
(c). tomato juice = $\frac{70}{220} = 31\frac{7}{11}\%$
(d). pineapple juice = $\frac{40}{220} = 18\frac{2}{11}\%$

