4.11 Circles: Circumference and Area: 2-hour Pack

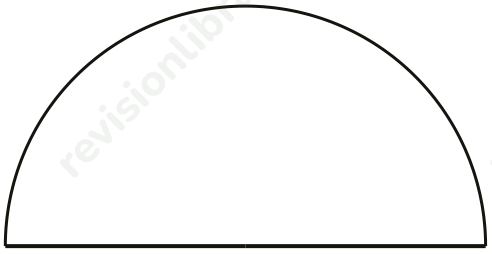
Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A semicircle has radius 9 cm. Work out its area. Use π = 3.14.

Diagram NOT accurately drawn

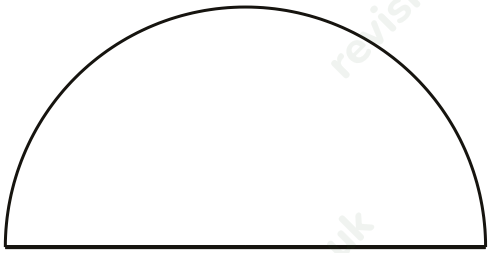


(3)

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2 A semicircle has diameter 16 cm. Work out its perimeter, including the diameter. Give your answer in terms of π.

Diagram NOT accurately drawn

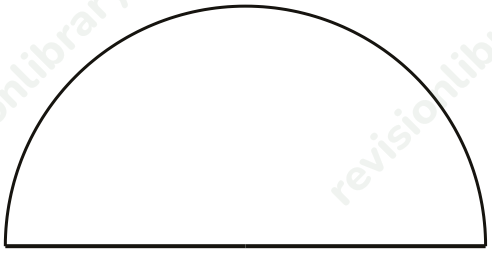


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3 A semicircle has radius 14 cm. Work out its area. Use π = 3.14.

Diagram NOT accurately drawn



(3)

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4 A circle has diameter 17 cm. Work out its circumference. Use π = 3.14.

(2)

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5 A wheel has diameter 100 cm. Work out how far the wheel travels in 20 complete turns. Give your answer in metres. Use π = 3.14.

(3)

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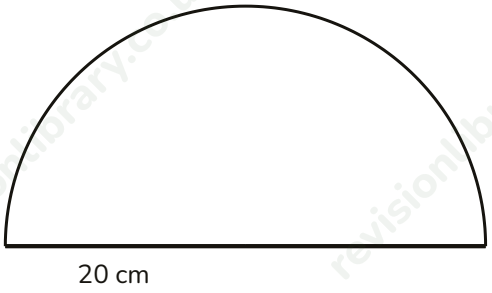
6 A circle has diameter 14 cm. Work out its circumference. Use π = 3.14.

(2)

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7 A semicircle has diameter 20 cm. Work out its perimeter, including the diameter. Give your answer in terms of π.

Diagram NOT accurately drawn



(3)

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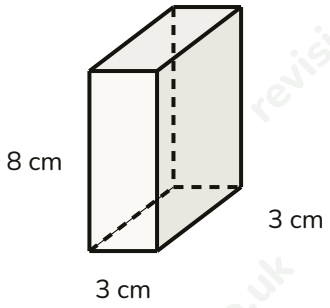
8 A circular table top has diameter 100 cm. Work out its area. Use π = 3.14.

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9 A cuboid measures 3 cm by 3 cm by 8 cm. Work out its volume.

Diagram NOT accurately drawn

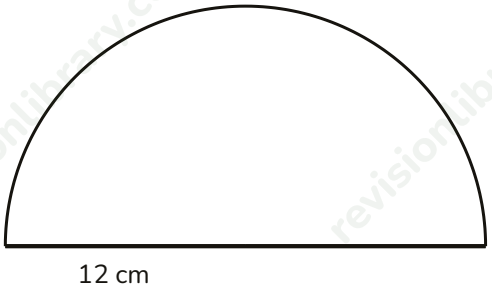


(2)

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10 A semicircle has diameter 12 cm. Work out its perimeter, including the diameter. Give your answer in terms of π.

Diagram NOT accurately drawn



(3)

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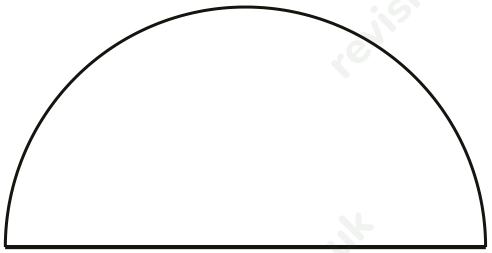
11 A circular pond has radius 9 m. A fence is built right around the edge. Work out the length of the fence. Use π = 3.14.

(2)

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12 A semicircle has diameter 10 cm. Work out its perimeter, including the diameter. Give your answer in terms of π.

Diagram NOT accurately drawn

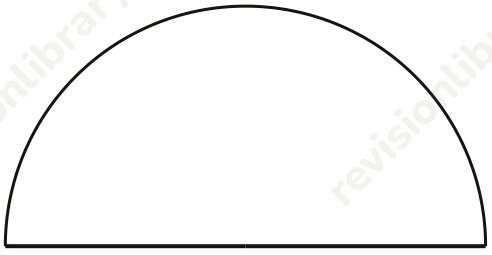


(3)

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13 A semicircle has radius 3 cm. Work out its area. Use π = 3.14.

Diagram NOT accurately drawn



(3)

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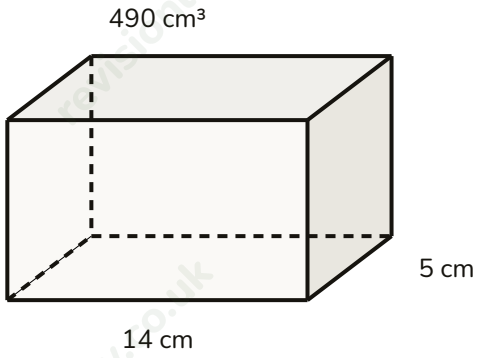
14 A wheel has diameter 50 cm. Work out how far the wheel travels in 50 complete turns. Give your answer in metres. Use π = 3.14.

(3)

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15 A cuboid has volume 490 cm³. Its length is 14 cm and its width is 5 cm. Work out its height.

Diagram NOT accurately drawn

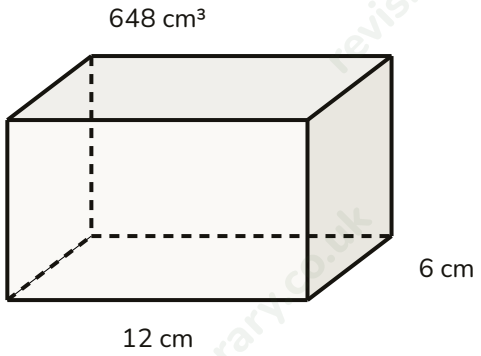


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16 A cuboid has volume 648 cm³. Its length is 12 cm and its width is 6 cm. Work out its height.

Diagram NOT accurately drawn



(3)

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17 A tyre has outer radius 32 cm. A small sticker on the tyre travels once around the tyre. How far does the sticker travel? Give your answer in metres to 1 decimal place.

(2)

---

18 A circular table top has diameter 50 cm. Work out its area. Use π = 3.14.

(3)

---

19 The area of a circle is 50.24 cm². Work out its radius. Use π = 3.14.

(3)

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20 A circular table top has diameter 80 cm. Work out its area. Use π = 3.14.

(3)

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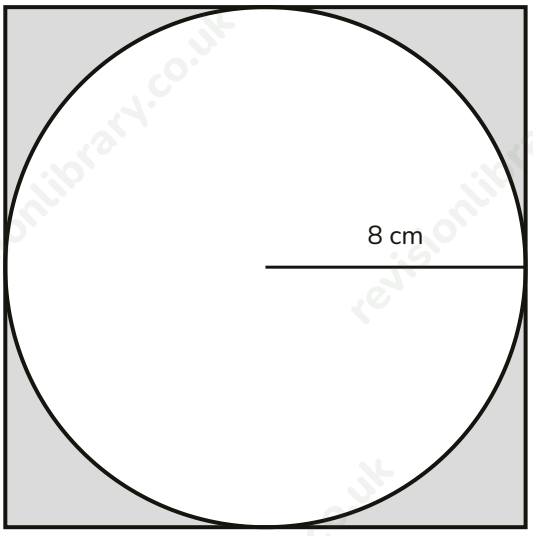
21 A circle has radius 3 cm. Give its circumference in terms of π.

(2)

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22 A circle of radius 8 cm fits exactly inside a square. Work out the area of the square not covered by the circle. Use π = 3.14.

Diagram NOT accurately drawn

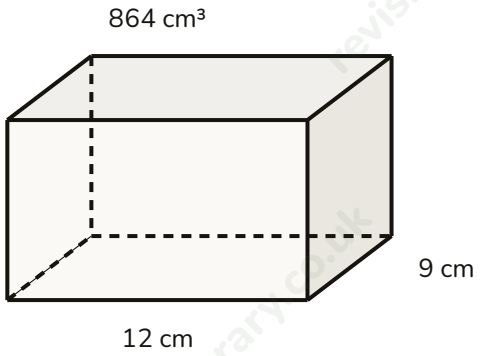


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23 A cuboid has volume 864 cm³. Its length is 12 cm and its width is 9 cm. Work out its height.

Diagram NOT accurately drawn



(3)

---

24 A wheel has diameter 80 cm. Work out how far the wheel travels in 100 complete turns. Give your answer in metres. Use π = 3.14.

(3)

---

25 Find the circumference of a circle whose area is 50pi cm^2. Give your answer in terms of π.

(2)

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26 A circular clock face has radius 12 cm. Draw a semicircular arc on the face and shade the semicircle. Calculate the perimeter of the shaded semicircle including the straight edge. Give your answer to 1 decimal place.

(3)

---

27 A circular rug has radius 2.5 m. Calculate its area. Give your answer to 1 decimal place. Use $\pi = 3.14$.

(2)

---

28 A circular flower bed has area 200.96 cm². Calculate its radius. Use $\pi = 3.14$.

(2)

---

29 Find the circumference of a circle whose area is 78.5 cm². Use $\pi = 3.14$.

(2)

---

30 A running track's inner edge is a circle of circumference 188.4 m. Calculate the radius of the inner edge. Use $\pi = 3.14$. Give your answer in metres.

(3)

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31 The area of a circular garden is 1256 m². Calculate the radius of the garden. Use π = 3.14. Give your answer in metres.

(3)

---

32 A circular rubber washer has outer radius 12 cm and inner radius 9 cm. Find the area of the ring-shaped washer. Give your answer in terms of π.

(3)

---

33 A semicircular flower bed has diameter 12 m and sits against a straight wall along its diameter.

(a) Find the area of the flower bed. Give your answer in terms of π. **(2)**

(b) Find the perimeter of the flower bed, including the straight edge along the wall. Give your answer to 1 decimal place, using π = 3.14. **(2)**

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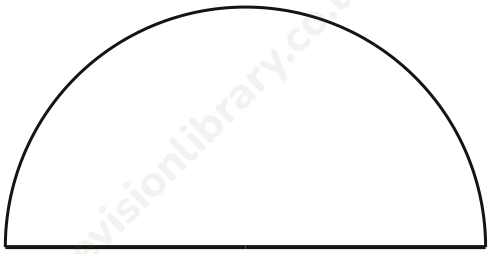
34 A circle has diameter 30 cm. Calculate its circumference. Give your answer in terms of π.

(1)

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35 A semicircle has radius 8 cm. Write down, in terms of π, the length of its curved (arc) edge.

Diagram NOT accurately drawn



Radius = 8 cm

(1)

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Mark scheme · 4.11 Circles: Circumference and Area: 2-hour Pack

Question 1

3.14×9^2	M1
$\div 2$	M1
127.17 cm² cao	A1

Answer: **$127.17\ cm^2$**

Question 2

half the circumference: 8π	M1
adds the diameter 16	M1
$8\pi + 16$ cm cao	A1

Answer: **$8\pi + 16$ cm**

Question 3

3.14×14^2	M1
$\div 2$	M1
307.72 cm² cao	A1

Answer: **$307.72\ cm^2$**

Question 4

3.14×17	M1
53.38 cm cao	A1

Answer: **53.38 cm**

Question 5

$3.14 \times 100 = 314$	M1
$\times 20$ and $\div 100$	M1
62.8 m cao	A1

Answer: **62.8 m**

Question 6

3.14×14	M1
43.96 cm cao	A1

Answer: **43.96 cm**

Question 7

half the circumference: 10π	M1
adds the diameter 20	M1
$10\pi + 20$ cm cao	A1

Answer: **$10\pi + 20$ cm**

Question 8

radius 50	M1
3.14×50^2	M1
7850 cm² cao	A1

Answer: **$7850\ cm^2$**

Question 9

$3 \times 3 \times 8$	M1
72 cm³ cao	A1

Answer: **$72\ cm^3$**

Question 10

half the circumference: 6π	M1
adds the diameter 12	M1
$6\pi + 12$ cm cao	A1

Answer: **$6\pi + 12$ cm**

Question 11

$2 \times 3.14 \times 9$	M1
56.52 m cao	A1

Answer: **56.52 m**

Question 12

half the circumference: 5π	M1
adds the diameter 10	M1
$5\pi + 10$ cm cao	A1

Answer: **$5\pi + 10$ cm**

Question 13

3.14×3^2	M1
$\div 2$	M1
14.13 cm² cao	A1

Answer: **$14.13\ cm^2$**

Question 14

$3.14 \times 50 = 157$	M1
$\times 50$ and $\div 100$	M1
78.5 m cao	A1

Answer: **78.5 m**

Question 15

$14 \times 5 = 70$	M1
$490 \div 70$	M1
7 cm cao	A1

Answer: **7 cm**

Question 16

$12 \times 6 = 72$	M1
$648 \div 72$	M1
9 cm cao	A1

Answer: **9 cm**

Question 17

method: circumference = $2 \times \pi \times 32$ cm	M1
2.0 m cao	A1

Answer: **2.0 m**

Question 18

radius 25	M1
3.14×25^2	M1
1962.5 cm² cao	A1

Answer: **$1962.5\ cm^2$**

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Question 19

$50.24 = 3.14 \times r^2$	M1
$r^2 = 16$	M1
4 cm cao	A1

Answer: **4 cm**

Question 20

radius 40	M1
3.14×40^2	M1
5024 cm² cao	A1

Answer: **5024 cm^2**

Question 21

$2 \times \pi \times 3$	M1
$6\ \pi$ cm cao	A1

Answer: **6 π cm**

Question 22

square side 16	M1
square area 256	M1
circle area $3.14 \times 8^2 = 200.96$	M1
55.04 cm² cao	A1

Answer: **55.04 cm^2**

Question 23

$12 \times 9 = 108$	M1
$864 \div 108$	M1
8 cm cao	A1

Answer: **8 cm**

Question 24

$3.14 \times 80 = 251.2$	M1
$\times 100$ and $\div 100$	M1
251.2 m cao	A1

Answer: **251.2 m**

Question 25

find r from area = πr^2 so $r^2 = 50$, $r = \sqrt{50}$	M1
circumference = $2\text{pi } r = 2\text{pi } \sqrt{50} = 10\text{pi } \sqrt{2}$ cm oe	A1

Answer: **$10\text{pi } \sqrt{2}$ cm**

Question 26

recognise perimeter = half circumference + diameter = $\pi r + 2r$	M1
substitute r = 12 to get $\pi \times 12 + 24$	M1
61.7 cm cao	A1

Answer: **61.7 cm**

Question 27

3.14×2.5^2 or equivalent method	M1
19.6 cao	A1

Answer: **19.6 m^2**

Question 28

rearrange to $r^2 = 200.96 / 3.14 = 64$	M1
8 cao	A1

Answer: **8 cm**

Question 29

find radius from area: $r^2 = 78.5 / 3.14 = 25$, so r = 5	M1
31.4 cao	A1

Answer: **31.4 cm**

Question 30

rearrange circumference formula to $r = C / (2 \times \pi)$	M1
substitute 188.4 / 6.28	M1
30 cao	A1

Answer: **30 m**

Question 31

rearrange to $r^2 = A / \pi$	M1
1256 / 3.14 = 400	M1
20 cao	A1

Answer: **20 m**

Question 32

outer area = $\pi \times 12^2 = 144\text{pi}$	M1
inner area = $\pi \times 9^2 = 81\text{pi}$	M1
63pi cao	A1

Answer: **63pi cm^2**

Question 33

(a) half $\times \pi \times 6^2$	M1
(a) 18pi cao	A1

(a) Answer: **18pi m^2**

(b) half circumference + diameter, i.e. $(3.14 \times 6) + 12$	M1
(b) 30.8 cao	A1

(b) Answer: **30.8 m**

Question 34

30pi cao	B1

Answer: **30pi cm**

Question 35

8pi cao	B1

Answer: **8pi cm**

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