# 3.16F Area and Circumference of Circles: Foundation Tier Practice

Total Marks

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 50 minutes

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** Work out the circumference of a circle with radius 7 cm. Use $\pi = 3.14$.

**(Total for Question 1 is 1 mark)**

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**2** Work out the circumference of a circle with diameter 10 cm. Use $\pi = 3.14$.

**(Total for Question 2 is 1 mark)**

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**3** Work out the area of a circle with radius 5 cm. Use $\pi = 3.14$.

**(Total for Question 3 is 2 marks)**

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**4** A circular roundabout has diameter 12 m. Work out its area. Use $\pi = 3.14$ and give your answer to 1 decimal place.

**(Total for Question 4 is 2 marks)**

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**5** Work out the radius of a circle whose circumference is 18.84 cm. Use $\pi = 3.14$ and give your answer to 1 decimal place.

**(Total for Question 5 is 2 marks)**

**6** A circular flower bed has area 50.24 $m^2$. Use $\pi = 3.14$. Work out the radius of the flower bed, giving your answer to 2 decimal places.

**(Total for Question 6 is 3 marks)**

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**7** Work out the circumference of a circle with radius 2.5 cm. Use $\pi = 3.14$ and give your answer to 2 decimal places.

**(Total for Question 7 is 3 marks)**

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**8** A circular pond has radius 4 m. A path of width 1 m runs all around the pond (the path is a ring around the circle). Work out the area of the path. Use $\pi = 3.14$ and give your answer to 1 decimal place.

**(Total for Question 8 is 3 marks)**

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**9** The circumference of a circular track is 62.8 m. Use $\pi = 3.14$. Work out the diameter of the track, giving your answer to 1 decimal place.

**(Total for Question 9 is 4 marks)**

**10** A circular table top has area 153.86 $cm^2$. Use $\pi = 3.14$. Work out the diameter of the table top, giving your answer to 1 decimal place.

**(Total for Question 10 is 4 marks)**

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**11** A circular sticker has circumference 18.84 cm. Use $\pi = 3.14$. Work out the area of the sticker. Give your answer to 2 decimal places.

**(Total for Question 11 is 4 marks)**

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**12** A circular water tank has area 201.06 $m^2$. Use $\pi = 3.14$.
(a) Work out the radius of the tank to 2 decimal places.
(b) Hence work out the circumference of the tank to 2 decimal places.

**(a)** (a) Work out the radius of the tank to 2 decimal places. **(3)**

**(b)** (b) Hence work out the circumference of the tank to 2 decimal places. **(3)**

**(Total for Question 12 is 6 marks)**

# Mark scheme · 3.16F Area and Circumference of Circles: Foundation Tier Practice

## Question 1

- **B1** circumference = 2 * π * 7 = 2 * 3.14 * 7 = 43.96 cm; 43.96 or 44.0 awrt
- **Answer: 43.96 cm (or 44.0 cm awrt 2 sf/1 dp acceptable). The mark scheme accepts 43.96 cao or rounded to 44.0 awrt if a calculator is used and rounding shown explicitly in working (or implied by display).**

## Question 2

- **B1** circumference = π * diameter = 3.14 * 10 = 31.4 cm cao
- **Answer: 31.4 cm**

## Question 3

- **M1** use area = π * $r^2$, substitution: 3.14 * $5^2$
- **A1** 78.5 $cm^2$ cao
- **Answer: 78.5 $cm^2$**

## Question 4

- **M1** use r = 6 m, area = π * $r^2$ = 3.14 * $6^2$
- **A1** 113.0 $m^2$ cao (3.14 * 36 = 113.04 rounds to 113.0 $m^2$ to 1 dp)
- **Answer: 113.0 $m^2$**

## Question 5

- **M1** use circumference = 2 * π * r, so r = circumference / (2 * π)
- **A1** r = 18.84 / (2 * 3.14) = 3.0 cm cao (18.84 / 6.28 = 3.0)
- **Answer: 3.0 cm**

## Question 6

- **M1** use area = π * $r^2$ and rearrange: r = $\sqrt{\text{area / \&π;}}$
- **M1** substitute: r = $\sqrt{50.24 / 3.14}$
- **A1** r = 4.00 m awrt (50.24 / 3.14 = 16; $\sqrt{16}$ = 4.00)
- **Answer: 4.00 m**

## Question 7

- **M1** use C = 2 * π * r, substitution: 2 * 3.14 * 2.5
- **A1** 15.7 cm cao (2 * 3.14 * 2.5 = 15.7)
- **A1** answer to 2 dp 15.70 cm awrt
- **Answer: 15.70 cm**

## Question 8

- **M1** area of outer circle with radius 5 m and inner circle radius 4 m; method: area difference = π * $5^2$ - π * $4^2$
- **M1** substitute using 3.14: 3.14 * (25 - 16) = 3.14 * 9
- **A1** 28.3 $m^2$ cao (3.14 * 9 = 28.26 rounds to 28.3 to 1 dp)
- **Answer: 28.3 $m^2$**

## Question 9

- **M1** use C = π * d, so d = C / π
- **M1** substitute: d = 62.8 / 3.14
- **A1** d = 20.0 m cao (62.8 / 3.14 = 20.0)
- **B1** final answer given with units m
- **Answer: 20.0 m**

## Question 10

- **M1** use area = $\pi * r^2$, so $r^2$ = area / $\pi$
- **M1** substitute: $r^2 = 153.86 / 3.14 = 49.0$
- **A1** r = 7.0 cm cao
- **A1** diameter = 14.0 cm cao with units
- **Answer: 14.0 cm**

## Question 11

- **M1** find radius from circumference: r = C / (2 * $\pi$)
- **M1** substitute r = 18.84 / (2 * 3.14) = 3.0
- **M1** use area = $\pi * r^2$ and substitute: $3.14 * 3.0^2$
- **A1** area = 28.26 $cm^2$ => 28.26 $cm^2$ to 2 dp = 28.26 $cm^2$ cao
- **Answer: 28.26 $cm^2$**

## Question 12

- (a) **M1** use r = $\sqrt{\text{area} / \&\pi;}$
- (a) **M1** substitute: r = $\sqrt{201.06 / 3.14}$
- (a) **A1** r = 8.00 m awrt (201.06 / 3.14 = 64.03; $\sqrt{64.03}$ = 8.00 awrt)
- **(a) Answer: 8.00 m**
- (b) **M1** use C = 2 * $\pi$ * r with r from part (a)
- (b) **M1** substitute: C = 2 * 3.14 * 8.00
- (b) **A1** C = 50.24 m cao (2 * 3.14 * 8 = 50.24)
- **(b) Answer: 50.24 m**