Exercise walk-through

Polar Function Graphs ▪ 3.14

eXercise

You must be able to

- interpret a **polar function 极坐标函数** $r = f(\theta)$
- recognise the circle $r =$ constant

Method — Polar graphs

A polar function $r = f(\theta)$ gives the distance r from the origin at each angle θ.

- $r =$ constant is a **circle** centred at the origin;
- $r = a\cos\theta$ is a circle through the origin;
- $r = a + b\cos\theta$ is a **limaçon**.

Method — Example

$r = 4$ is a circle of radius 4 centred at the origin.

Practice 2.1 ▪ 1 mark

State what $r = 3$ graphs in polar form.

Solution 2.1

Method: Polar graphs

Worked steps

a circle of radius 3 centred at the origin **B1**.

Practice 2.2 ▪ 1 mark

State what $r = f(\theta)$ represents.

Solution 2.2

Worked steps

the distance from the origin as a function of the angle B1.

Practice 2.3 ▪ 1 mark

For $r = 2$, state the radius of the circle.

Solution 2.3

Method: Example

Worked steps

2 B1.

Exam-style 3.1 ▪ 1 mark

The polar graph $r = 5$ is

A a line

B a circle of radius 5

C a spiral

D a single point

Solution 3.1

A a line

B a circle of radius 5 ✓

C a spiral

D a single point

Worked steps

B.

Exam-style 3.2 ▪ 1 mark

In $r = f(\theta)$, r represents the

A angle

B distance from the origin

C slope

D area

Solution 3.2

A angle

B distance from the origin ✓

C slope

D area

Worked steps

B.

Exam-style 3.3 ▪ 1 mark

Consider $r = 4$.
(a) State the shape.
(b) State the radius.
(c) State the centre.

Solution 3.3

Worked steps

(a) a circle B1. (b) 4 B1. (c) the origin B1.