MATHS

BOOKS - INDEPENDENTLY PUBLISHED MATHS (ENGLISH)

POLAR COORDINATES

Example

1. Express point P whose rectangular coordinates are $\left(3, 3\sqrt{3}\right)$ in terms of polar

coordinates

$r^2 = x^2 + y^2 = 9 + 27 = 36$

$r = 6$

$r\cos\theta = x$

$\cos\theta = \frac{3}{6} = \frac{1}{2}$

Therefore $\theta = 60^\circ$ and $(6, 60^\circ)$ are the polar coordinates of P

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2. Describe the graphs of r=2

$r^2 = x^2 + y^2$

$r = 2$

Therefore $x^2 + y^2 = 4$ which is the equation of a circle whose center is at the origin and whose radius is 2

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3. Describe the graph of $r = \dfrac{1}{\sin\theta}$

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Exercises

1. A point has polar coordinate $(2, 60^\circ)$ The same point can be represented by

A. $(-2, 240^\circ)$

B. $(2, 240^\circ)$

C. $(-2, 60^\circ)$

D. $(2, -60^\circ)$

Answer: a

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2. The polar coordinates of a point P are $(2, 200^\circ)$ The rectangular coordinates of P are

A. $(-1.88, -0.68)$

B. $(-0.68, -1.88)$

C. $(-0.34, -0.94)$

D. $(-0.47, -0.17)$

Answer: a

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3. Describe the graph of $r = \dfrac{3}{\cos\theta}$

A. a parabola

B. an ellipse

C. a circle

D. a vertical line

Answer: d

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