Second Year Test 18

Version 0

1. A circle has parametric equations $x = \sin t - 5, \quad y = \cos t + 2$
a) Find a Cartesian equation of the circle

b) Write down the radius and the coordinates of the centre of the circle

c) Write down a suitable domain of t which defines one full revolution around the circle.

2. A coin is tossed 20 times and lands on heads 6 times. Is there sufficient evidence to conclude that the coin is biased? Use a 5% significance level.

Version P

1. A circle has parametric equations $x = 3\sin t + 1, \quad y = 3\cos t - 1$
a) Find a Cartesian equation of the circle

b) Write down the radius and the coordinates of the centre of the circle

c) Write down a suitable domain of t which defines one full revolution around the circle.

2. A coin is tossed 40 times and lands on heads 14 times. Is there sufficient evidence to conclude that the coin is biased? Use a 5% significance level.

Answers

Version O

1. a) $(x+5)^2+(y-2)^2=1$
b) Centre (-5,2), radius 1
c) $0 \leq t \leq 2\pi$

2. $P(X \leq 6) = 0.0577 > 0.025$ (use a two tailed test). No reason to reject H_O.

Version P

1. a) $(x-1)^2+(y+1)^2=9$
b) Centre (1,-1), radius 3
c) $0 \leq t \leq 2\pi$

2. $P(X \leq 14) = 0.0403 > 0.025$ (use a two tailed test). No reason to reject H_O.