Areas

6 questions | 12 marks

Equivalent correct methods earn the corresponding marks.

1. Find the area between y=x squared and y=2x. [2 marks]

The intersections are 0 and 2.

Integrate 2x-x squared over that interval.

Answer: 4/3 square units

2. Find the area under y=4-x squared above the x axis. [2 marks]

Zeros are -2 and 2.

Integrate 4-x squared between them.

Answer: 32/3 square units

3. Find the area between y=|x| and the axis on [-1,1]. [2 marks]

Use two congruent right triangles.

Each has area 1/2.

Answer: 1 square unit

4. Find the area between y=x and y=sin x on [0,pi]. [2 marks]

x is at least sin x throughout this interval.

Integrate x-sin x and evaluate endpoints.

Answer: $\pi^2/2 - 2$ square units

5. Find area between x=y squared and x=4 for 0<=y<=2. [2 marks]

Horizontal slices have width 4-y squared.

Integrate from y=0 to 2.

Answer: 16/3 square units

6. A student reports area zero between y=x cubed and the x axis on [-1,1]. Correct the result. [2 marks]

The signed integral is zero, but areas add.

Use twice the integral of x cubed from 0 to 1.

Answer: 1/2 square unit