Vector Calculus

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Rectangular Co-ordinates

Polar Co-ordinates

Rectanglar Co-ordinates

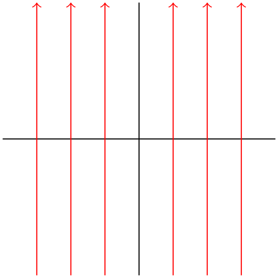
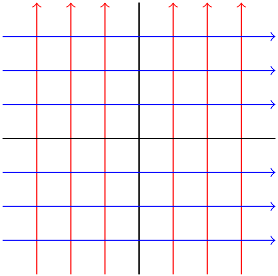


Figure : $x =$constant, $y =$constant

Rectanglar Co-ordinates



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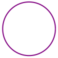
Polar co-ords

Figure : $r =$constant, $\theta =$constant

Polar co-ords



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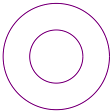

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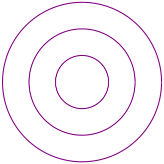

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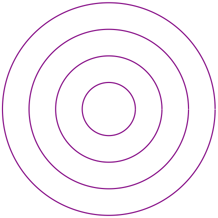

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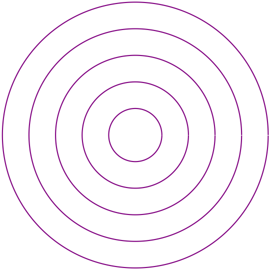

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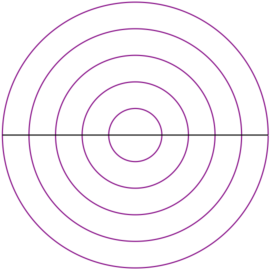

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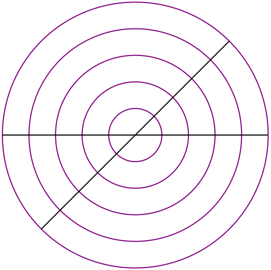

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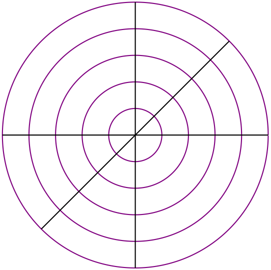
Polar co-ords



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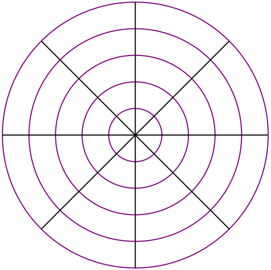

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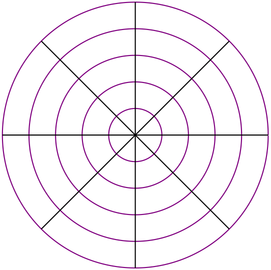

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Some picture

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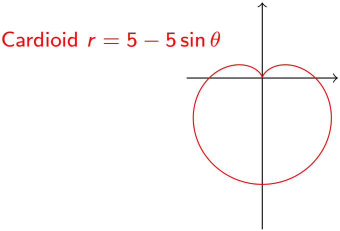

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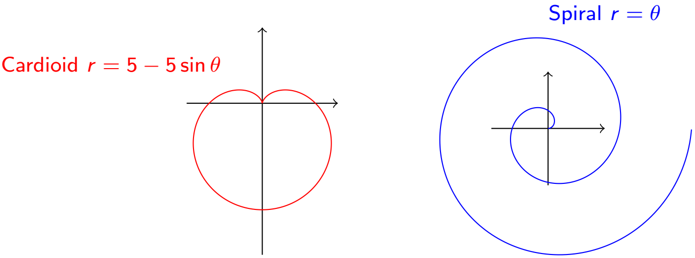
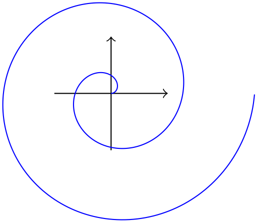
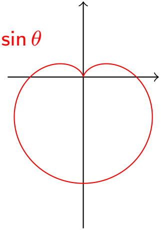


Some picture

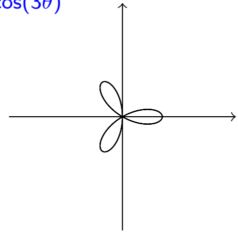
Spiral $r = \theta$



Cardioid $r = 5 - 5\sin\theta$



Rose $r = \cos(3\theta)$



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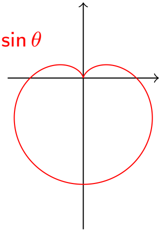
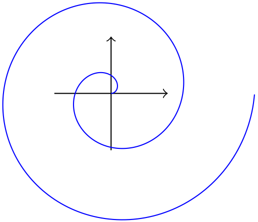


Spiral $r = \theta$



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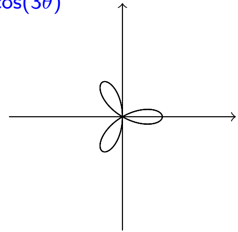
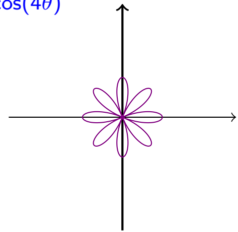


Rose $r = \cos(4\theta)$



1. Method of calculating $\iint f$ on Polar Co-ordinates
2. $x = r\cos(\theta)$ $y = r\sin(\theta)$

$$\iint_R f(x,y)dA = \int_a^b \int_{h_1(\theta)}^{h_2(\theta)} f(r,\theta)rdrd\theta$$

Polar co-ordinates (r, θ)

1. Find the limits of integration for the region lies inside the cardiod $r = 1 + \cos\theta$ and outside the circle $r = 1$
2. $r = 1 + \sin\theta$ and $r = 1$

Find the area in polar co-ordinates.

1. positive x-axis and spiral $r = 4\theta/3$, $0 \leq \theta \leq 2\pi$ $64/27\pi^3$
2. One leaf of the rose $r = 12cos3\theta$ 12π

Change cartesian to polar

Change the cartesian integral into an equivalent polar integral, then evaluate the polar integral

1. $\int_{-1}^{1} \int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} dydx$ 4/3
2. $\int_{0}^{2} \int_{0}^{\sqrt{1-(x-1)^2}} \frac{x+y}{x^2+y^2} dydx$ $\pi/2 + 1$