Dette er tekst.

$4 + 4;$

$$8 \quad (1)$$

$4 + 4 :$

$4 \cdot 4;$

$$16 \quad (2)$$

$\frac{4}{4};$

$$1 \quad (3)$$

$a + b;$

$$a + b \quad (4)$$

$(a + b)^2;$

$$(a + b)^2 \quad (5)$$

a^2

$a := 3;$

$$3 \quad (6)$$

$a;$

$$3 \quad (7)$$

$b := x^2 - 9;$

$$x^2 - 9 \quad (8)$$

$simplify\left(\frac{b}{x + 3}\right);$

$$x - 3 \quad (9)$$

$solve(x^2 - 3 \cdot x + 2 = 0, x);$

$$2, 1 \quad (10)$$

f:=x->

$f := x \rightarrow \frac{3 \cdot x}{1 + 9 \cdot x^2};$

$$x \rightarrow \frac{3\,x}{1 + 9\,x^2} \quad (11)$$

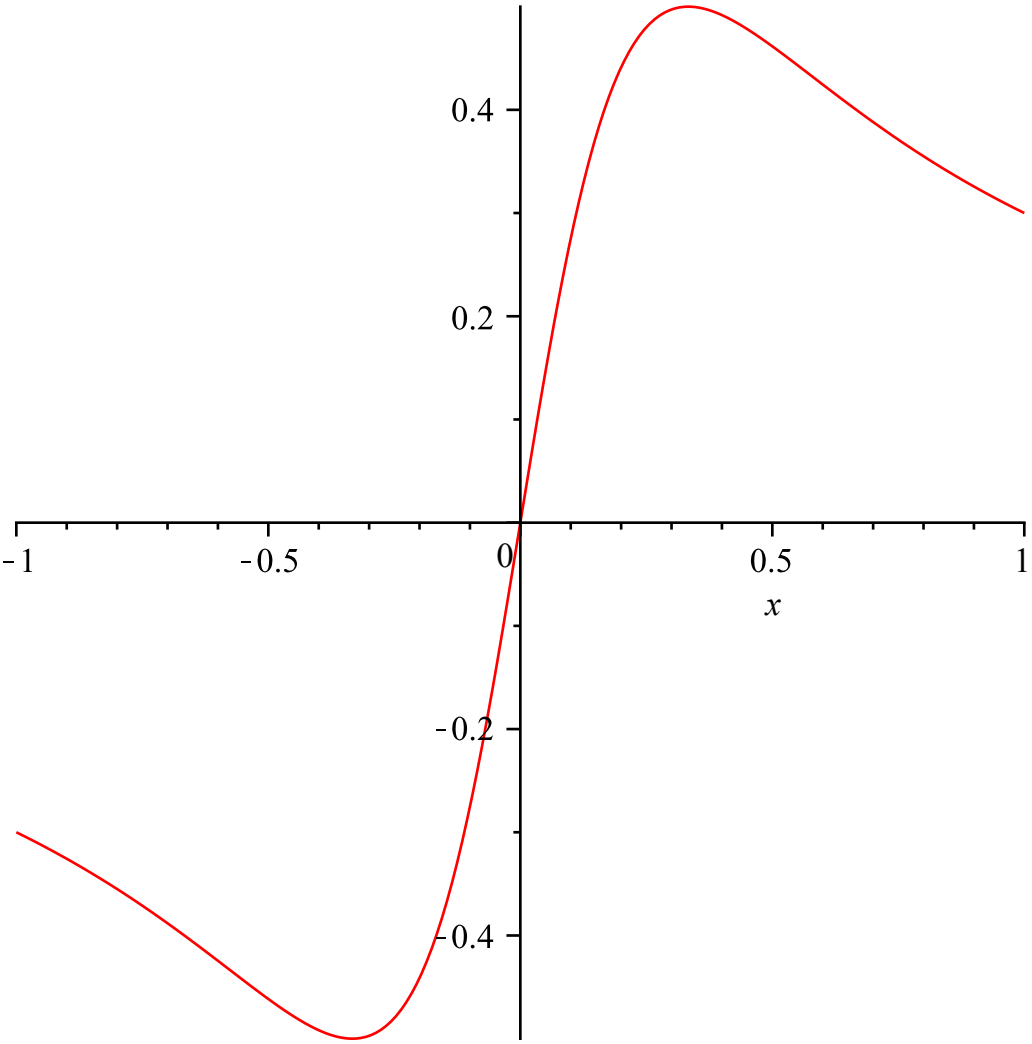
$f(0);$

$$0 \quad (12)$$

$f(1);$

$$\frac{3}{10} \tag{13}$$

$plot(f(x), x = -1..1);$




$\frac{d}{dx} f(x);$

$$\frac{3}{1+9x^2} - \frac{54x^2}{(1+9x^2)^2} \tag{14}$$

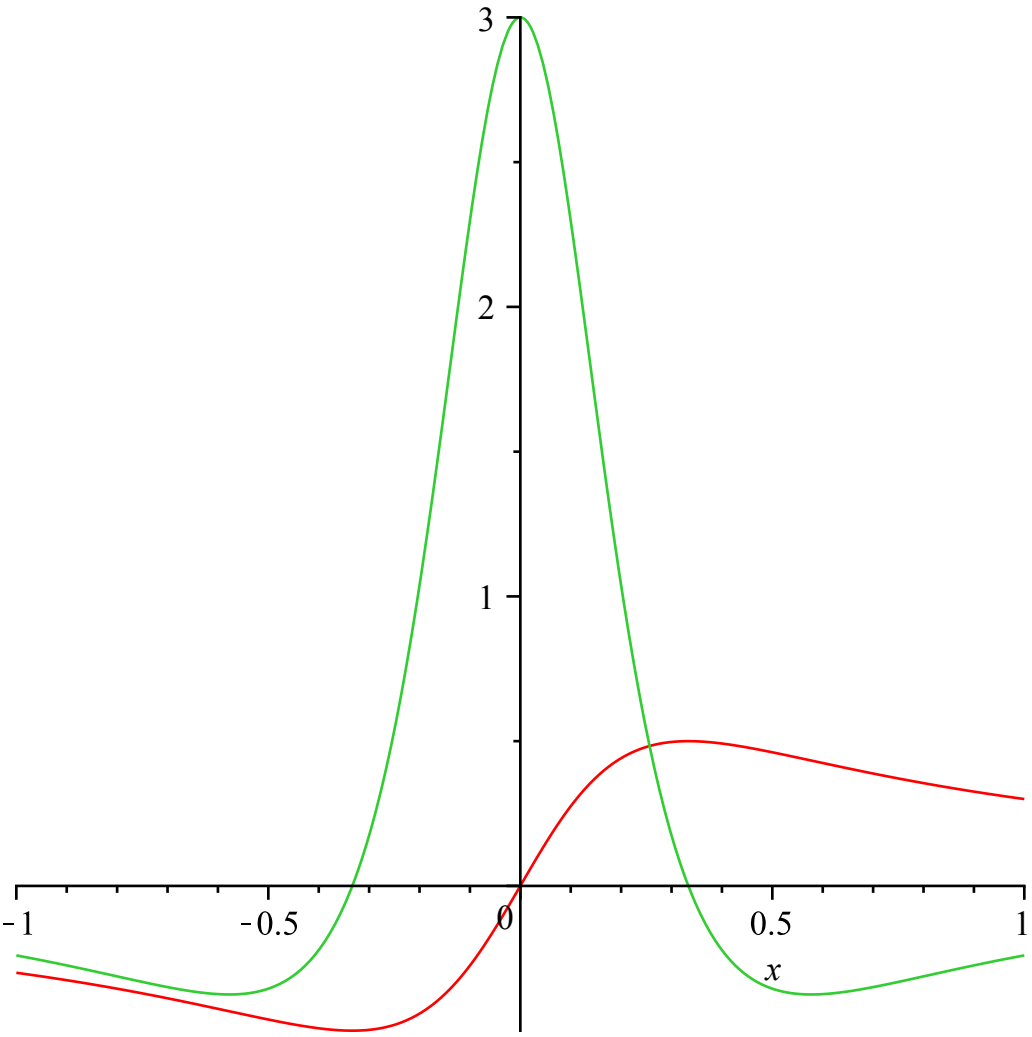
$diff(f(x), x);$

$$\frac{3}{1+9x^2} - \frac{54x^2}{(1+9x^2)^2} \tag{15}$$

$simplify(diff(f(x), x));$

$$-\frac{3\left(-1+9x^2\right)}{\left(1+9x^2\right)^2} \tag{16}$$

$plot(\{f(x), diff(f(x), x)\}, x=-1..1);$



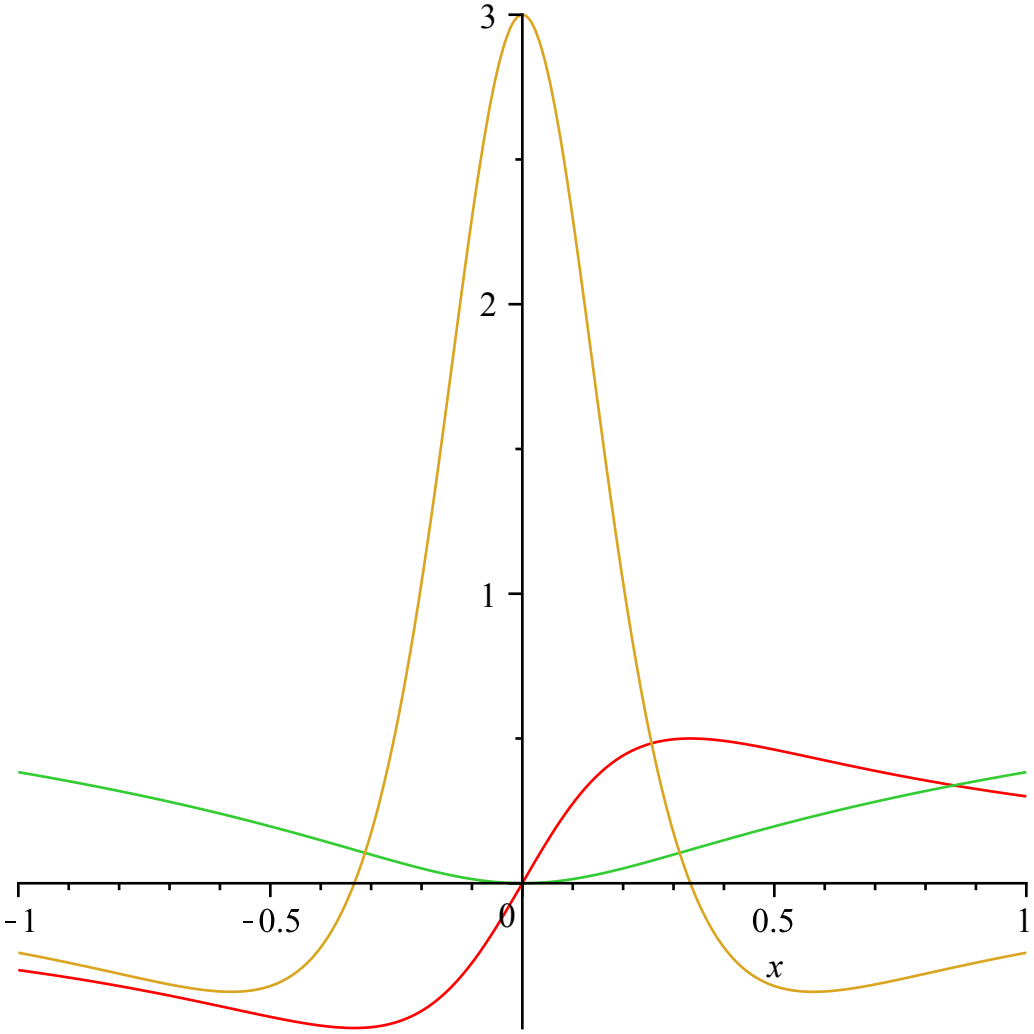

$\int f(x)\,dx;$

$$\frac{1}{6}\ln\left(1+9x^2\right) \tag{17}$$

$int(f(x), x);$

$$\frac{1}{6}\ln\left(1+9x^2\right) \tag{18}$$

$plot(\{f(x), diff(f(x), x), int(f(x), x)\}, x=-1..1);$




$$\int_0^1 f(x)\,dx;$$

$$\frac{1}{6}\ln(2) + \frac{1}{6}\ln(5) \quad \textbf{(19)}$$

$$simplify\left(\int_0^1 f(x)\,dx\right);$$

$$\frac{1}{6}\ln(2) + \frac{1}{6}\ln(5) \quad \textbf{(20)}$$

$$solve(f(x) = 0.2,\ x);$$

$$0.06957071750,\ 1.597095949 \quad \textbf{(21)}$$

$$circle := x^2 + y^2 = 1;$$

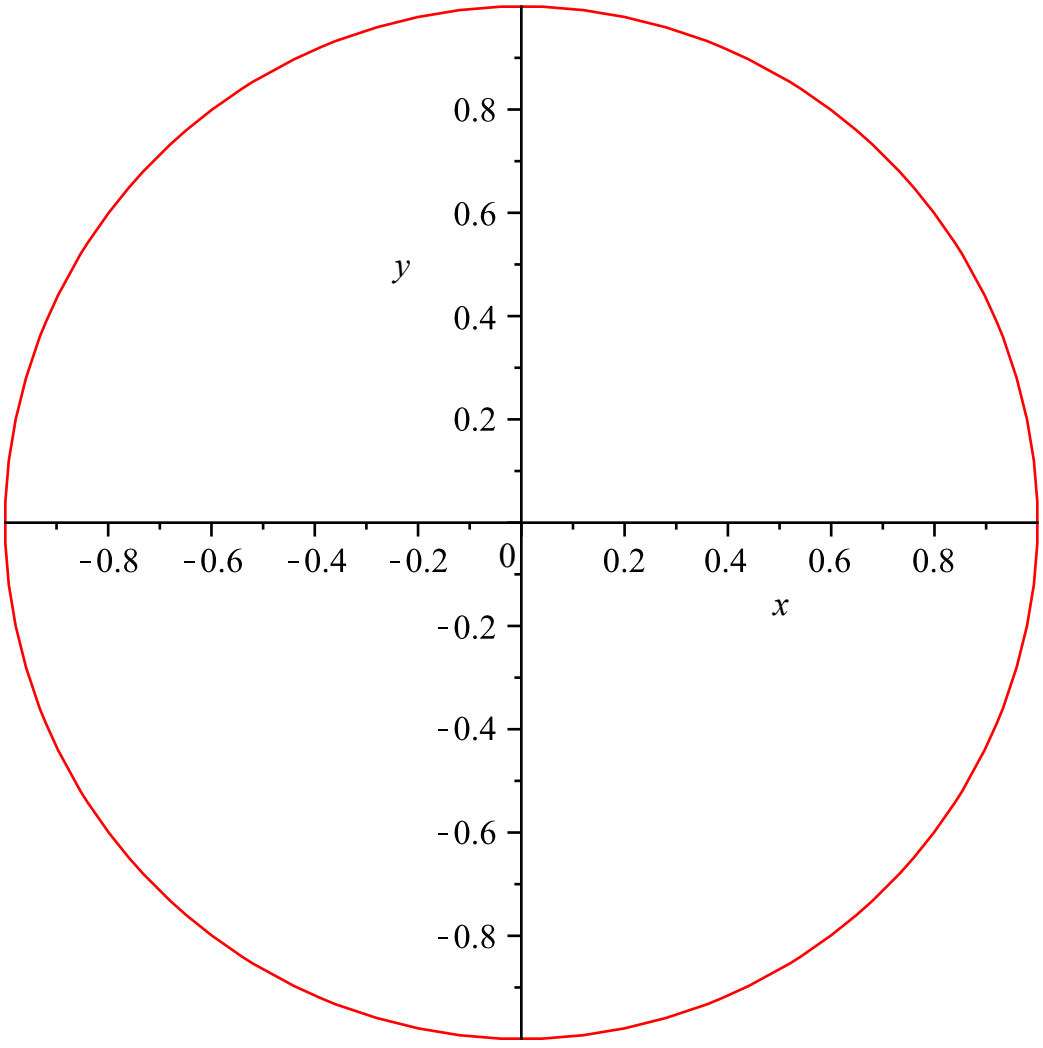
$$x^2 + y^2 = 1 \quad \textbf{(22)}$$

```
with(plots);
```

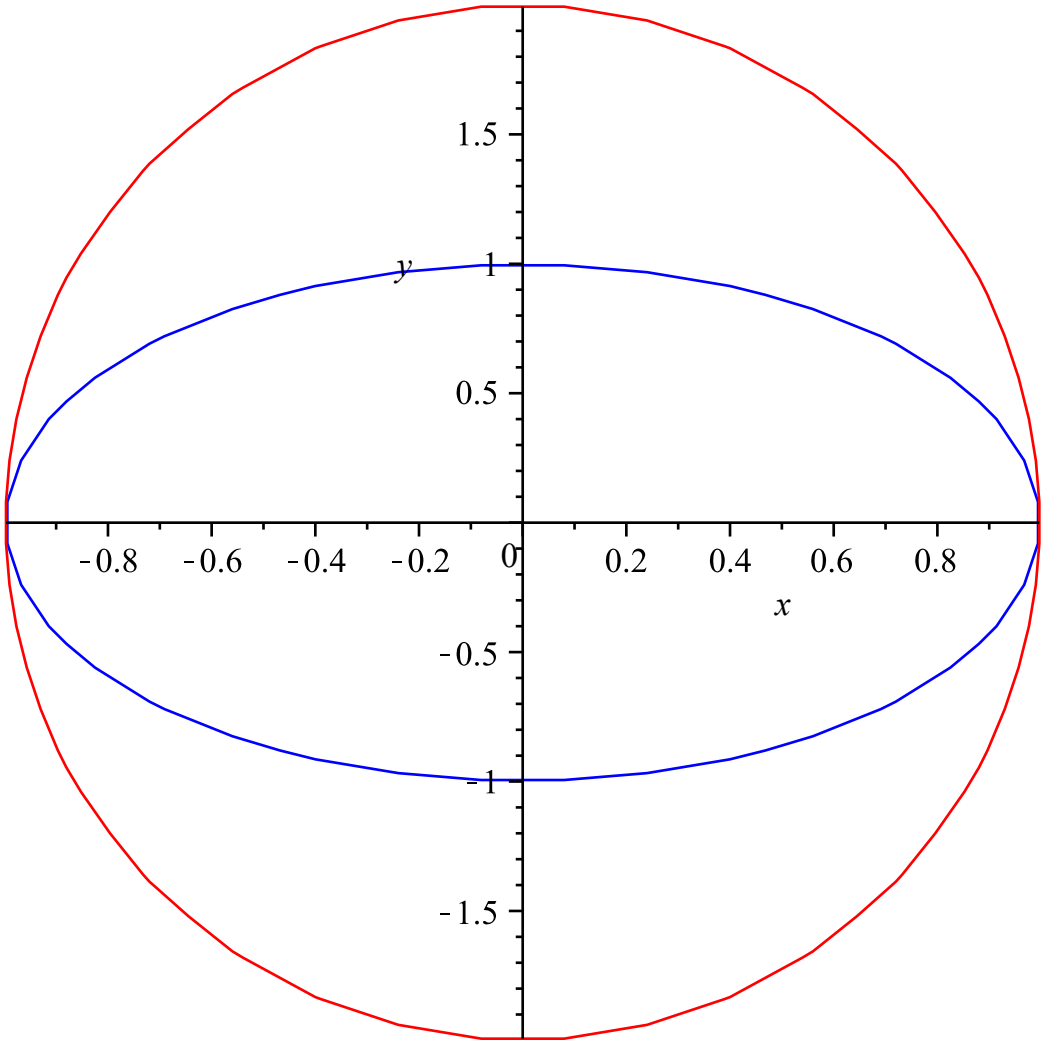
```
[animate, animate3d, animatecurve, arrow, changecoords,
    complexplot, complexplot3d, conformal, conformal3d, contourplot,
    contourplot3d, coordplot, coordplot3d, densityplot, display,
    dualaxisplot, fieldplot, fieldplot3d, gradplot, gradplot3d,
    implicitplot, implicitplot3d, inequal, interactive, interactiveparams,
    intersectplot, listcontplot, listcontplot3d, listdensityplot, listplot,
    listplot3d, loglogplot, logplot, matrixplot, multiple, odeplot, pareto,
    plotcompare, pointplot, pointplot3d, polarplot, polygonplot,
    polygonplot3d, polyhedra_supported, polyhedraplot, rootlocus,
    semilogplot, setcolors, setoptions, setoptions3d, spacecurve,
    sparsematrixplot, surfdata, textplot, textplot3d, tubeplot]
```

**(23)**

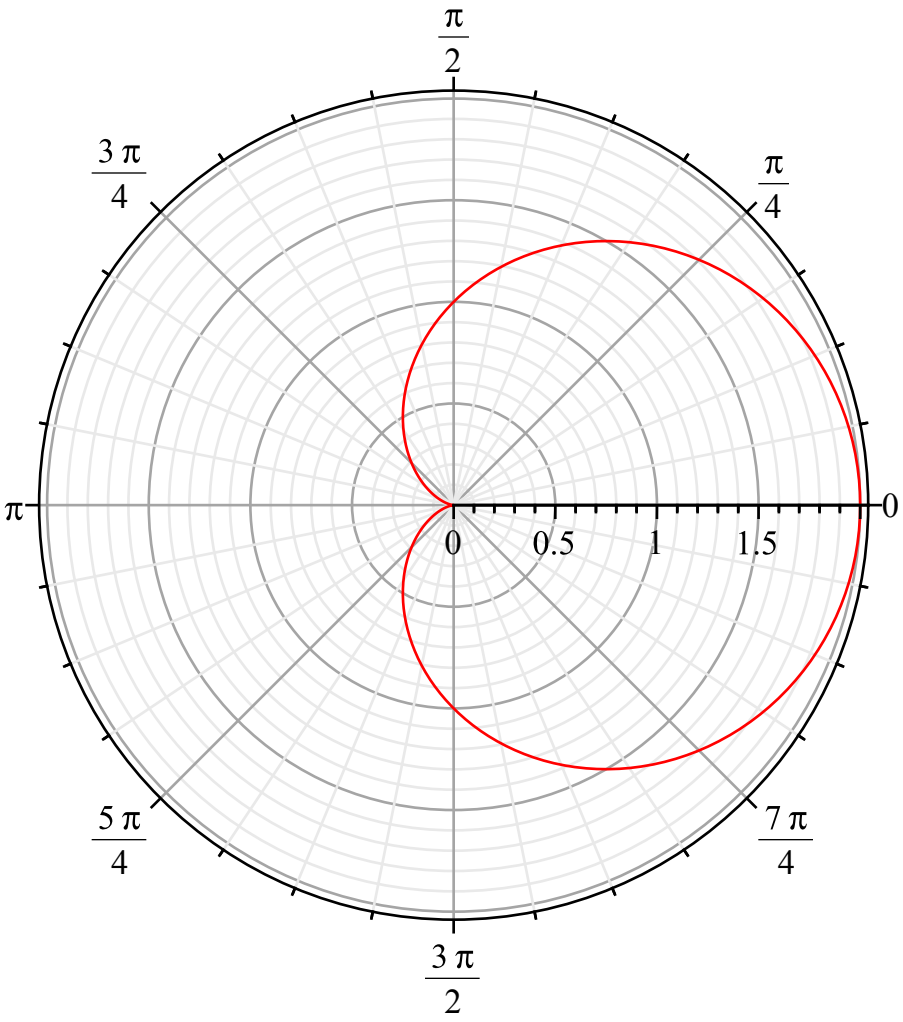
```
implicitplot(circle, x = -1 ..1, y = -1 ..1);
```



$$implicitplot\left(\left\{circle,\ \frac{y^2}{4}+x^2=1\right\},\ x=-2\ ..2,\ y=-2\ ..2\right);$$




$$polarplot(1+\cos(\text{theta}),\ \text{theta}=0\ ..2\cdot\text{Pi});$$




$evalf\left(\frac{4}{5}\right);$

$$0.8000000000 \tag{24}$$

$int\left(e^{-x^2}, x = 0..t\right);$

$$\frac{1}{2}\ \frac{\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{\ln(e)}\ t\right)}{\sqrt{\ln(e)}} \tag{25}$$

$evalf\left(int\left(e^{-x^2}, x = 0..4\right)\right);$

$$\frac{0.8862269255\ \mathrm{erf}\left(4.\sqrt{\ln(e)}\right)}{\sqrt{\ln(e)}} \tag{26}$$

$evalf\left(\mathrm{erf}(4)\right)$

$$0.9999999846 \tag{27}$$

$with(Student[VectorCalculus]);$

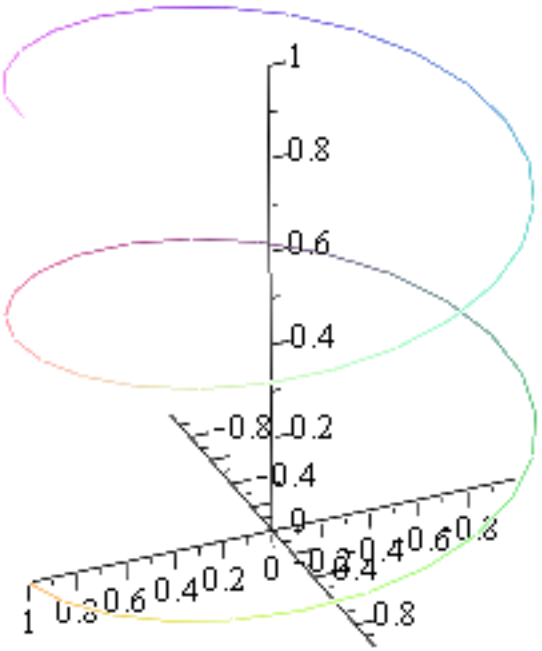
[*&x*, `*`, `+`, `-`, `.`, *<,>*, *<|>*, *About*, *ArcLength*, *BasisFormat*, *Binormal*, *ConvertVector*, *CrossProduct*, *Curl*, *Curvature*, D, *Del*, *DirectionalDiff*, *Divergence*, *DotProduct*, *FlowLine*, *Flux*, *GetCoordinates*, *GetPVDescription*, *GetRootPoint*, *GetSpace*, *Gradient*, *Hessian*, *IsPositionVector*, *IsRootedVector*, *IsVectorField*, *Jacobian*, *Laplacian*, *LineInt*, *MapToBasis*, *Nabla*, *Norm*, *Normalize*, *PathInt*, *PlotPositionVector*, *PlotVector*, *PositionVector*, *PrincipalNormal*, *RadiusOfCurvature*, *RootedVector*, *ScalarPotential*, *SetCoordinates*, *SpaceCurve*, *SpaceCurveTutor*, *SurfaceInt*, *TNBFrame*, *Tangent*, *TangentLine*, *TangentPlane*, *TangentVector*, *Torsion*, *Vector*, *VectorField*, *VectorFieldTutor*, *VectorPotential*, *VectorSpace*, *diff*, *evalVF*, *int*, *limit*, *series*] **(28)**

$r := t \to \langle \cos(4 \cdot \mathrm{Pi} \cdot t),\ \sin(4 \cdot \mathrm{Pi} \cdot t),\ t \rangle;$

$$t \to \mathit{Student:\text{-}VectorCalculus}:\text{-}<,>(\cos(4\,\pi\,t),\ \sin(4\,\pi\,t),\ t) \quad \textbf{(29)}$$

<cos(4*Pi*t),...>

$\mathit{SpaceCurve}(r(t),\ t = 0\ ..1,\ \mathit{axes} = \mathit{normal});$




Graph of the curve represented parametrically by the components of the given vector.

$TangentVector(r(t));$

$$\begin{bmatrix} -4\sin(4\pi t)\,\pi \\ 4\cos(4\pi t)\,\pi \\ 1 \end{bmatrix} \quad \textbf{(30)}$$

$TangentVector(r(t), normalized);$

$$\begin{bmatrix} -\frac{4\sin(4\pi t)\pi}{\sqrt{1+16\pi^2}} \\ \frac{4\cos(4\pi t)\pi}{\sqrt{1+16\pi^2}} \\ \frac{1}{\sqrt{1+16\pi^2}} \end{bmatrix} \tag{31}$$

$TNBFrame(r(t));$

$$\begin{bmatrix} -\frac{4\sin(4\pi t)\pi}{\sqrt{1+16\pi^2}} \\ \frac{4\cos(4\pi t)\pi}{\sqrt{1+16\pi^2}} \\ \frac{1}{\sqrt{1+16\pi^2}} \end{bmatrix}, \begin{bmatrix} -\cos(4\pi t) \\ -\sin(4\pi t) \\ 0 \end{bmatrix}, \begin{bmatrix} \frac{\sin(4\pi t)}{\sqrt{1+16\pi^2}} \\ -\frac{\cos(4\pi t)}{\sqrt{1+16\pi^2}} \\ \frac{4\pi}{\sqrt{1+16\pi^2}} \end{bmatrix} \tag{32}$$

$Curvature(r(t));$

$$\frac{16\sqrt{\frac{\cos(4\pi t)^2\pi^4}{1+16\pi^2}+\frac{\sin(4\pi t)^2\pi^4}{1+16\pi^2}}}{\sqrt{1+16\pi^2}} \tag{33}$$

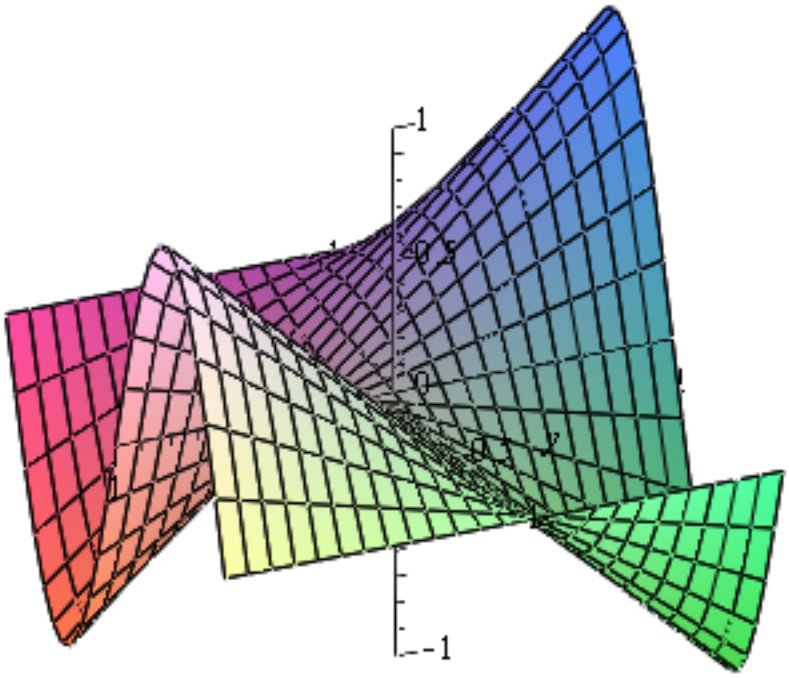
$simplify(Curvature(r(t)));$

$$\frac{16\pi^2}{1+16\pi^2} \tag{34}$$

$F := (x, y) \to x\cdot\sin(\mathrm{Pi}\cdot y);$

$$(x, y) \to x\sin(\pi y) \tag{35}$$

$plot3d(F(x, y), x = -1..1, y = -1..1, axes = normal);$




```
with(Student[MultivariateCalculus]);
```

```
[ApproximateInt, ApproximateIntTutor, CenterOfMass,
    ChangeOfVariables, CrossSection, CrossSectionTutor, Del,
    DirectionalDerivative, DirectionalDerivativeTutor,
    FunctionAverage, Gradient, GradientTutor, Jacobian,
    LagrangeMultipliers, MultiInt, Nabla, Revert, SecondDerivativeTest,
    SurfaceArea, TaylorApproximation, TaylorApproximationTutor]
```

**(36)**

```
Gradient(F(x, y))
```

```
Error, invalid input: Gradient uses a 2nd
argument, pts (of type {list(name), list(name) =
list({name, And(realcons, Not(infinity))}), list
(name) = listlist({name, And(realcons, Not
(infinity))})}), which is missing
```

```
Gradient(F(x, y), [x, y]);
```

$$\begin{bmatrix} \sin(\pi y) \\ x\cos(\pi y)\,\pi \end{bmatrix} \tag{37}$$

*TaylorApproximation*$(F(x, y))$;

Error, invalid input: TaylorApproximation uses a 2nd argument, pts (of type {name = {name, And(realcons, Not(infinity))}, list(name) = list({name, And(realcons, Not(infinity))})}), which is missing

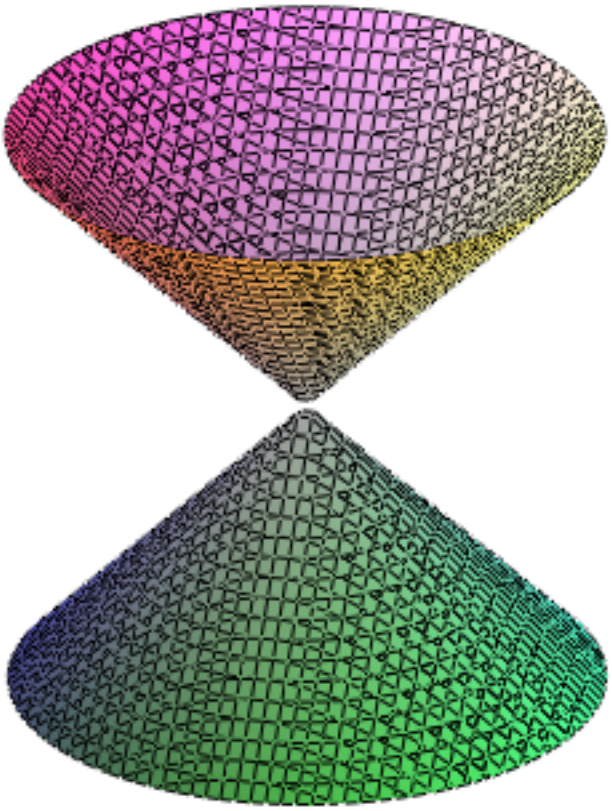
*TaylorApproximation*$(F(x, y), [x, y] = [0, 0])$;

$$\frac{1}{120}\,\pi^5\,x\,y^5 - \frac{1}{6}\,\pi^3\,x\,y^3 + \pi\,x\,y \tag{38}$$

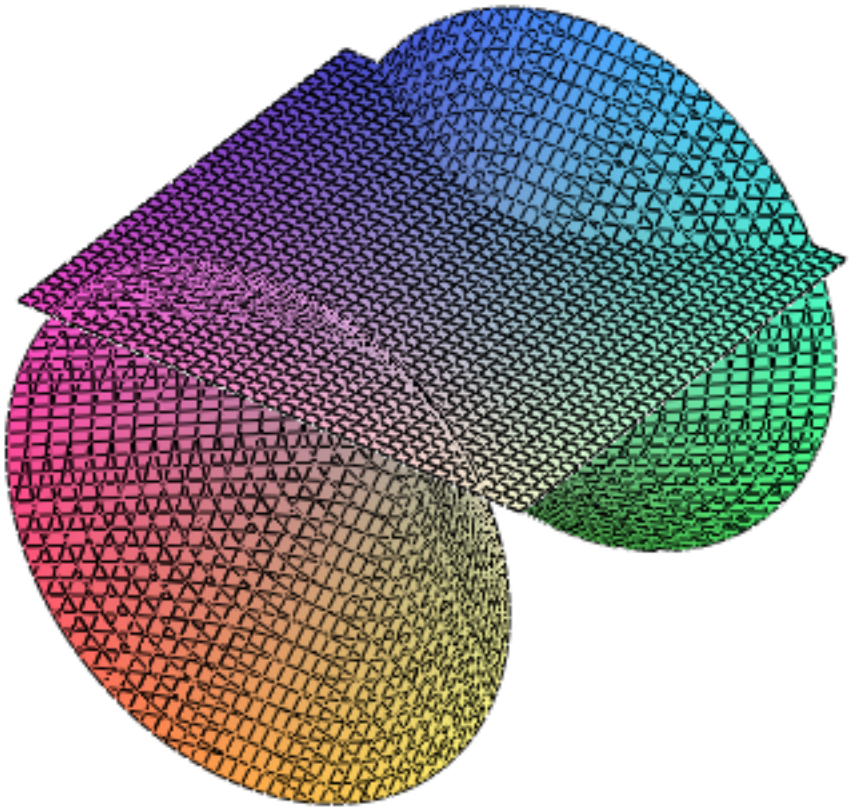
*mtaylor*$(F(x, y), [x, y], 20)$;

$$\begin{aligned} &\pi\,x\,y - \frac{1}{6}\,\pi^3\,x\,y^3 + \frac{1}{120}\,\pi^5\,x\,y^5 - \frac{1}{5040}\,x\,\pi^7\,y^7 + \frac{1}{362880}\,x\,\pi^9\,y^9 \\ &- \frac{1}{39916800}\,x\,\pi^{11}\,y^{11} + \frac{1}{6227020800}\,x\,\pi^{13}\,y^{13} \\ &- \frac{1}{1307674368000}\,x\,\pi^{15}\,y^{15} + \frac{1}{355687428096000}\,x\,\pi^{17}\,y^{17} \end{aligned} \tag{39}$$

*implicitplot3d*$(x^2 - y^2 = z^2, x = -4..4, y = -4..4, z = -4..4, grid = [40, 40, 40])$;



$$implicitplot3d(\{x^2 - y^2 = z^2,\ z = 2\},\ x = -4..4,\ y = -4..4,\ z = -4..4,\ grid = [40, 40, 40]);$$



$$intersectplot(x^2 - y^2 = z^2,\ z = 2,\ x = -4..4,\ y = -4..4,\ z = -4..4);$$