Tangent Planes

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The Maple worksheet shows a few examples of tangent planes.

```maple
> with(plots):
Warning, the name changecoords has been redefined

> f := x^4+y^2;

> plot3d(f,x=0..2,y=0..4,axes=boxed);

Use the Maple function "mtaylor" to find the equation of the tangent plane...

> L := mtaylor(g,{x=1,y=2},2);

> plot3d(f,x=0..2,y=0..4,axes=boxed,title="Tangent Plane at (1,2)");
```

```
> p1 := plot3d(f,x=0..2,y=0..4,axes=boxed,title="Tangent Plane at (1,2)");
> p2 := plot3d(L,x=0..2,y=0..4,color=green):
> display({p1,p2});
```
Now zoom in a bit...

> p1 := plot3d(f, x=0.75..1.25, y=1.75..2.25, axes=boxed, title="Tangent Plane at (1,2)"):
> p2 := plot3d(L, x=0.75..1.25, y=1.75..2.25, color=green):
> display({p1, p2});
Another example...

> g := x*exp(y)+x^2*y+1;

\[ g := x e^y + x^2 y + 1 \]

> K := mtaylor(g, {x=1, y=0}, 2);

\[ K := x + 2 y + 1 \]

> p1 := plot3d(g, x=0..2, y=-1..1, axes=boxed):
> p2 := plot3d(K, x=0..2, y=-1..1, axes=boxed, color=green):
> display({p1, p2});
Note that the graph is saddle-like, so the tangent plane cuts the graph along two curves.