True or false: If $\lim_{n\to\infty} a_n = 0$, then $\sum a_n$ is convergent.

This is the Maclaurin series for the function

$$f(x) = \frac{x^2}{1+x}$$

This is the general form of a power series.

This is the value of the sum of the series

$$1 - e + \frac{e^2}{2!} - \frac{e^3}{3!} + \frac{e^4}{4!} - \dots$$

This test may be used to determine the convergence of the series

$$\sum_{n=1}^{\infty} \frac{n}{n^3+1}$$

True or false: for any vectors $\mathbf{u}$ and $\mathbf{v}$ in $\mathbb{R}^3$, $\mathbf{u} \times \mathbf{v} = \mathbf{v} \times \mathbf{u}$.

This is a vector pointing from the point (8,2,7) to (1,9,8).

This is a drawing of the plane $x+y+z=8$ in the first octant.

This is a drawing of the surface described by $x^2 + 2z^2 = 1$.

This is a drawing of the surface described by $-x^2 + y^2 - z^2 = 1$.

If f has a local maximum at the point (a, b), then this is the value of $f_x(a, b) + f_y(a, b)$.

These are the coordinates of the local maximum of the function

$$f(x, y) = 3xy - x^2y - xy^2$$

If f has an absolute maximum at (a, b) and an absolute minimum at (c, d), then this word (eg. positive, negative, zero, non-positive, non-negative) describes $f(a, b) - f(c, d)$.

This is the value of the absolute maximum of the function

$$f(x, y) = 4xy^2 - x^2y^2 - xy^3$$

on the triangle with vertices at the origin, (0,6), and (6,0).

True or false: If $f(x, y)$ has two local maxima, then f must have a local minimum.

This is an estimate of

$$\iint_{[0,3]\times[0,3]} f(x,y)dA$$

where f is given by the below contour map and the sample points are upper-right corners.

This is an expression for $\iint_R f(x,y)dA$ as an iterated integral, where R is the region shown:

The volume of the solid tetrahedron with vertices (0,0,0), (0,0,1), (0,2,0), and (2,2,0).

The volume of one of the wedges cut from the cylinder $x^2+9y^2=a^2$ by the planes $z=0$ and $z=mx$.

The surface area of the intersecting cylinders $y^2+z^2=1$ and $x^2+z^2=1$, shown below:

The difference between an Aggie and a carp is that one is a bottom-feeding scum sucker and the other is one of these.

The number that an Aggie can't find on the telephone, preventing him from dialing 911 in an emergency.

This is how many credit-hours an Aggie gets for screwing in a light bulb.

This is what Aggies think Cheerios are.

The Aggie got fired from his job as a quality control inspector at the M&M plant because he kept throwing out all of these.

dz/dt, where $z = x^2y + xy^2, x = 2 + t^4$, and $y = 1 - t^3$.

The voltage V in a simple electrical circuit is slowly decreasing as the battery wears out. The resistance R is slowly increasing as the resistor heats up. Use Ohm's Law ($V = IR$) to find this, the change in current I, at the moment when $R = 400\Omega, I = 0.08A, dV/dt = -0.01V/s$, and $dR/dt = 0.03\Omega/s$.

$\partial z/\partial s$, where $z = x^2 + xy + y^2, x = s + t$, and $y = st$.

$\partial z/\partial u$, where $z = x^2 + xy^3, x = uv^2 + w^3$, and $y = u + ve^w$, when $u = 2, v = 1$, and $w = 0$.

$\partial z/\partial x$, where $x^2 + y^2 + z^2 = 3xyz$.

The direction $\mathbf{u}$ that maximizes the value of the directional derivative $D_{\mathbf{u}}f(x, y, z)$.

The direction you would go (up or down) if you were climbing south on a hill whose shape is given by $z = 1000 - 0.01x^2 - 0.02y^2$, where the positive x-axis points east and the positive y-axis points north, and you start at the point $(50, 80, 847)$.

The kind of vector that $\mathbf{u}$ is in the equation

$$D_{\mathbf{u}}f(x, y, z) = \nabla f(x, y, z) \cdot \mathbf{u}$$

The points on the hyperboloid $x^2 - y^2 + 2z^2 = 1$ where the normal line is parallel to the line that joins the points (3, -1, 0) and (5,3,6).

The direction in which the electric potential V changes most rapidly at $(3, 4, 5)$, where$V(x, y, z) = 5x^2 - 3xy + xyz$.

An expression (as a triple integral) for the volume of the wedge in the first octant that is cut from the cylinder $y^2 + z^2 = 1$ by the planes $y = x$ and $x = 1$.

The iterated integral with respect to $dxdzdy$ for the integral $\iiint_E f(x,y,z)dV$, where E is bounded by $z = 0, z = y$, and $x^2 = 1 - y$.

The average value of the function $f(x,y,z) = xyz$ over the cube with side length 5 that lies in the first octant with one vertex at the origin and edges parallel to the coordinate axes.

The volume of the solid tetrahedron with vertices (0,0,0), (0,0,1), (0,2,0), and (2,2,0).

The iterated integral with respect to $dxdydz$ where the original integral is

$$\int_0^1 \int_y^1 \int_0^y f(x,y,z)dzdxdy$$

There is no theory of this; instead, there is just a list of animals Chuck Norris allows to live.

This is the number of times that Chuck Norris has counted to infinity.

This is the chief export of Chuck Norris.

Chuck Norris does not sleep. Instead, he does this.

It took 10 days and this many women to give birth to Chuck Norris.

This person was impaled by a bicycle handlebar and had surgery to repair "index finger deep" muscle damage.

This person feeds almonds to squirrels on the way to class.

This person currently has his hair dyed blue.

This person can solve a Rubik's cube in less than five minutes!!! (sic)

This person breaks her vegan diet every time we have Tiff's Treats.

This person has a huge crush on JRD.

This person can wiggle her right ear, but not her left.

This person went to the beach everyday for a year and couldn't get a tan.

This person has a sugar packet collection.

This person can do the wave with his eyebrows.

An argument showing that $\cosh x \geq 1 + \frac{1}{2}x^2$ for all x.