

A Ring With A Fling To It

*Mathematical thoughts generated by
the Looff Carousel, Spokane, WA*

Elizabeth A. Williams

@RealityMinus3

Puddle of Mudd lead singer Wes Scantlin arrested after he's seen riding airport baggage carousel before concert

BY NINA GOLGOWSKI [Follow](#) / NEW YORK DAILY NEWS / Updated: Tuesday, February 24, 2015, 5:56 AM [A](#) [A](#) [A](#)

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ABC 7 DENVER

Puddle of Mudd front man Wes Scantlin was arrested late last month after seen riding a vertical baggage carousel, seen far back in orange, at the Denver International Airport.









(I forgot to take a snap of this. -E)

www.TheFlirtyBlog.com

When to fling the ring? How to model?

Hint: throw before you're opposite the clown's face

- ★ your own tangential velocity
- ★ height of horse (therefore your hand) at throwing point
- ★ force vector of your throw (throw tangentially?)
- ★ weight of ring
- ★ air density
- ★ turbulence around a flung torus (can you impart a stabilizing spin, Frisbee style?)

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- ★ **... too much like physics** *ack! ack! ack!*

Wheee velocity!

Carousel base: 25-foot radius → 157-foot circumference (from guide book)

10 revolutions per ride // 3 rev to get up to speed and 3 rev to slow to a stop
→ four revolutions at top speed

We timed these over three iterations

Average at full tilt: 13.2 sec/rev // 4.5 rev/min → pretty quick to cover 157 feet

Angular velocity $\omega = d\Phi/dt = 2\pi / 13.2 \text{ sec} = 0.476 \text{ rad/sec}$

Tangential velocity $v = r * d\Phi/dt = 25 \text{ ft} * 0.476 \text{ rad/sec} = 11.9 \text{ ft/sec} // 8.1 \text{ mph}$

(... okay, fine, 13.0 kmh :-p)

wheeEEEEeeeeEEEEeeee

Amplitude of horses' jumps: 0.75 feet ← estimate using Dad as yard stick

Radius of circle: 25 feet

Jumps per revolution: 6

Assumption: start and finish at same point in space

$$x = 25 \cos t$$

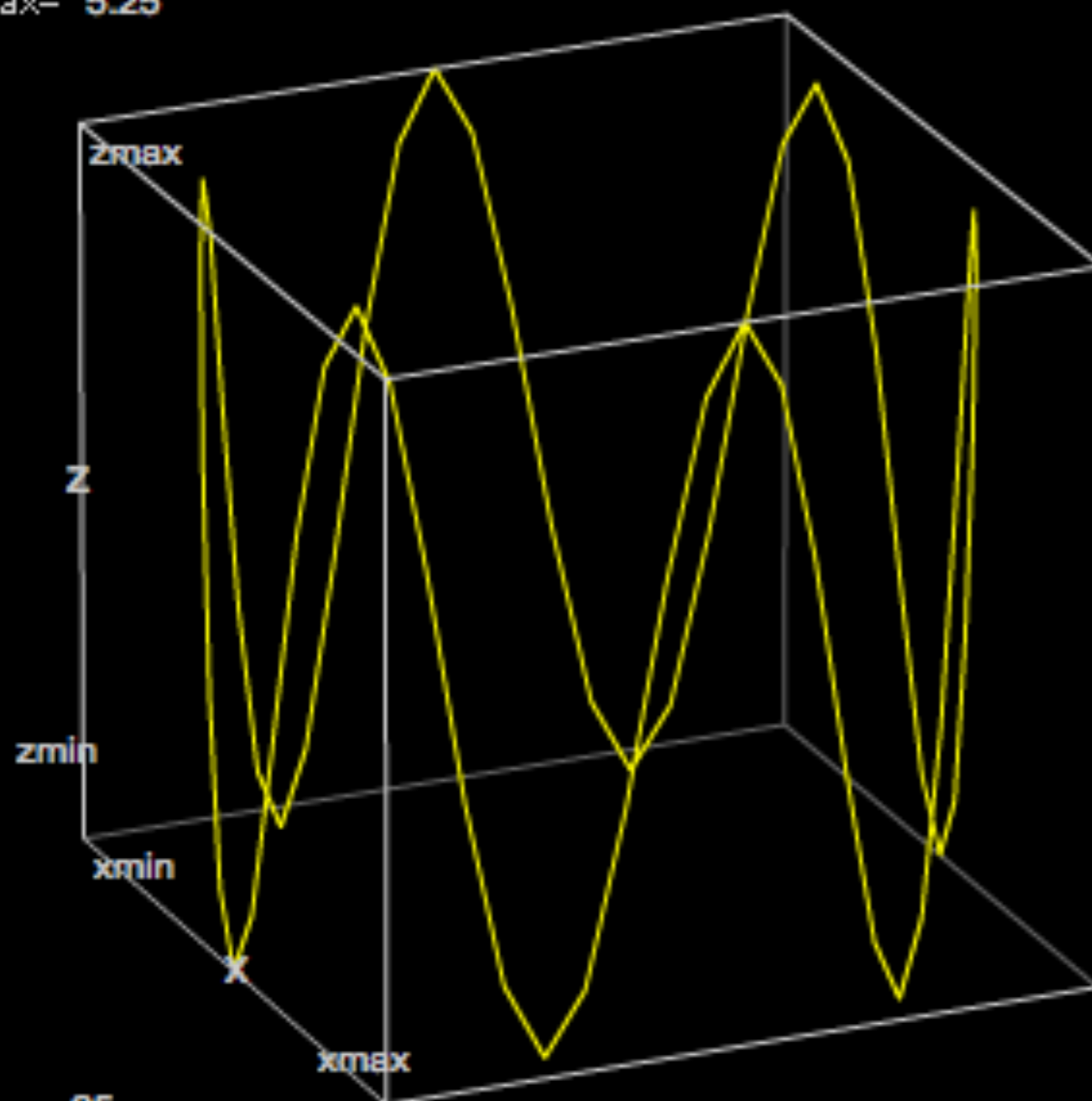
$$y = 25 \sin t$$

$$z = 0.75 \cos 6t + 4.5 \quad \leftarrow \text{cosine bc my horse started at maximum}$$

$$0 \leq t \leq 20\pi \quad \leftarrow \text{ten revolutions (assuming uniform speed)}$$

zmin= 3.75

zmax= 5.25



xmin= -25

xmax= 25

-25 = ymin

25 = ymax

Enter formulas for x, y, and z in ordinary syntax. For example:

$t \cdot \sin(t^2 +$

Mouse over the SYNTAX button

x=

y=

z=

Enter the range for t. (Numerical

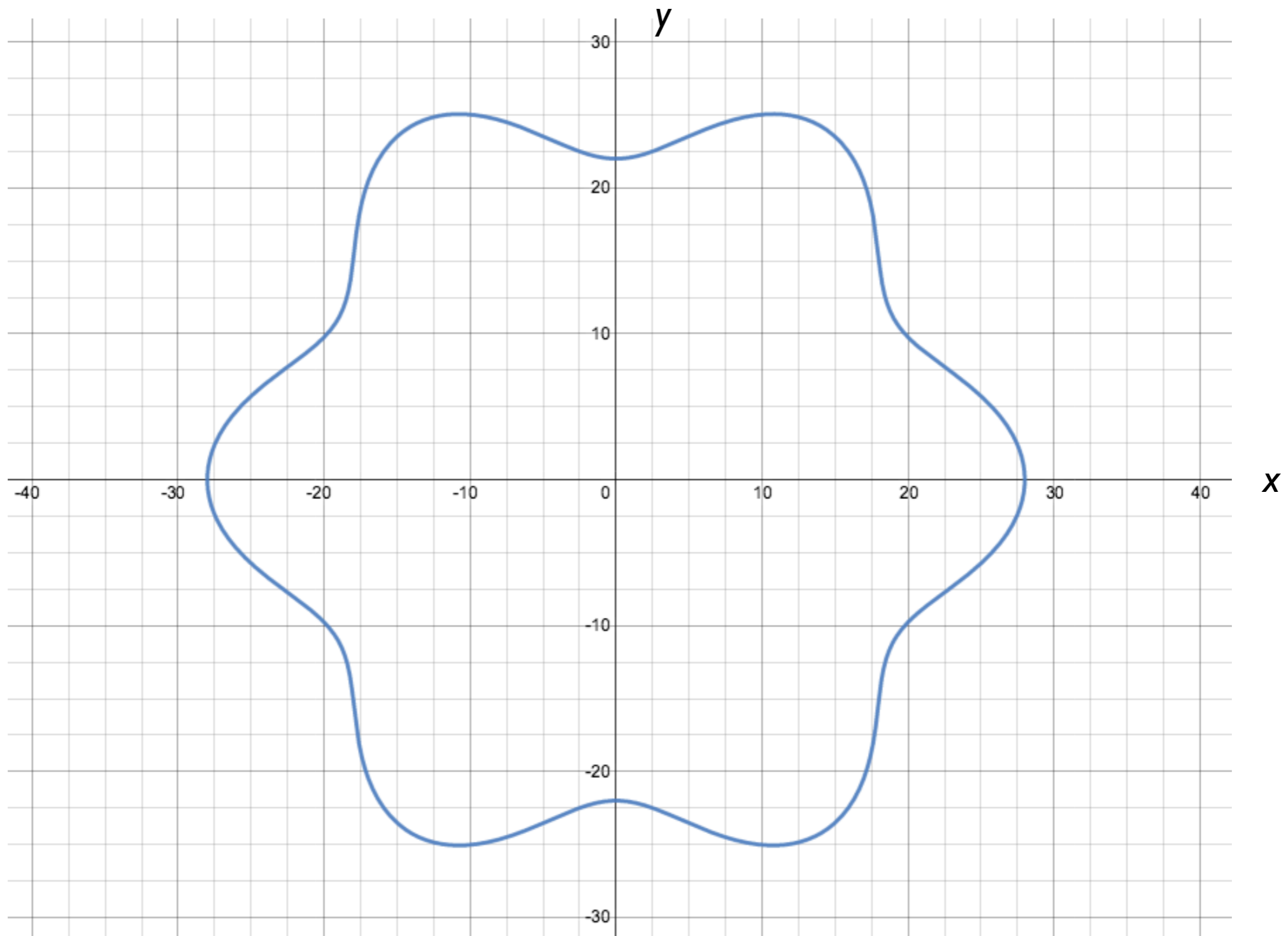
tmin=

tmax=



After you enter or click above settings, click





$$r = 3 \cos(6\theta) + 25$$

← wiggles exaggerated for effect

← ack! polar to parametric???

Polar to Parametric on a Cone

Generic circular cone: $cz^2 = x^2 + y^2$ ← c is some constant

Parametric circular cone: $x = r(t) \cos t$

$$y = r(t) \sin t$$

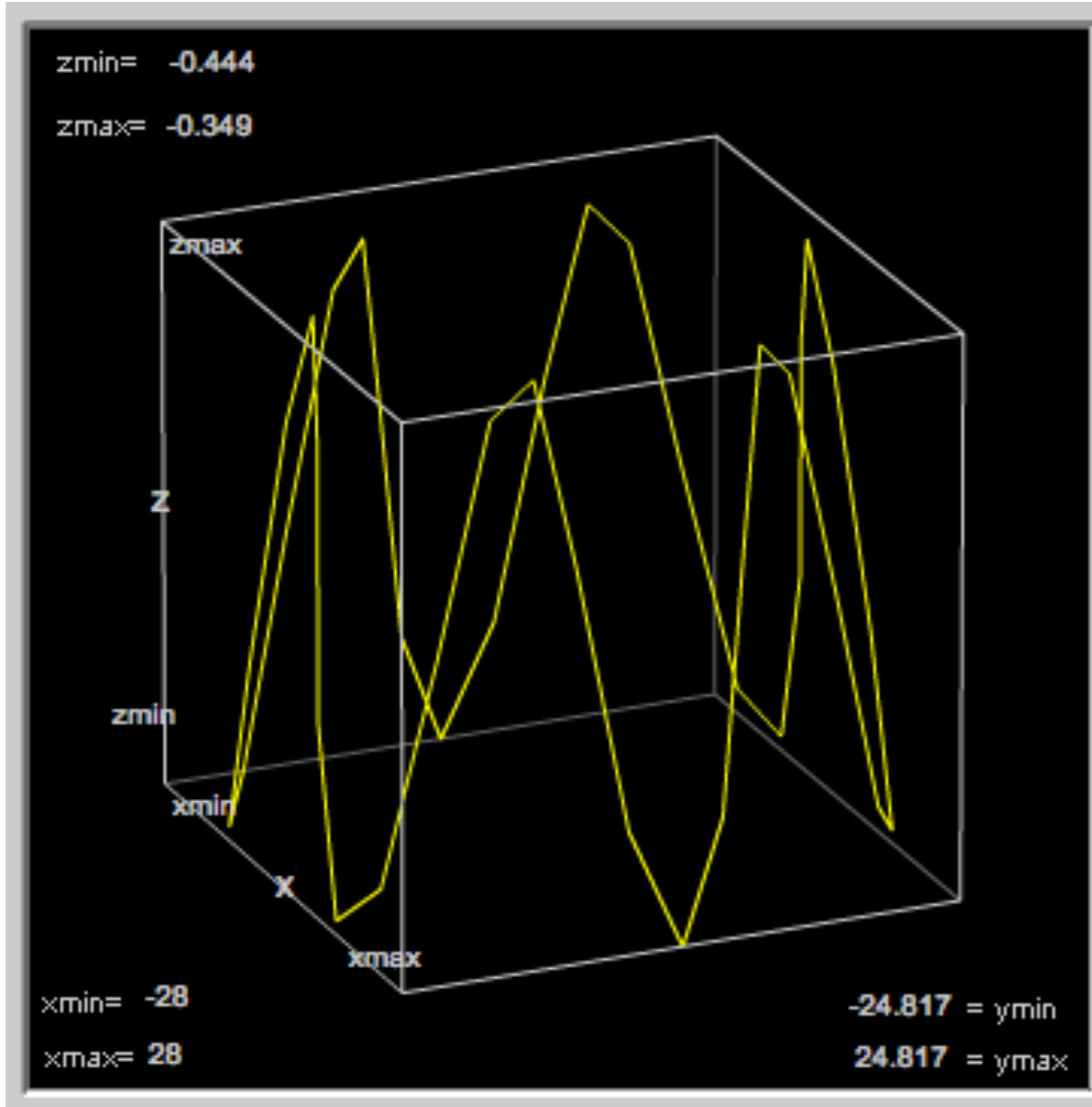
$$z = r(t) \tan A \quad \leftarrow A \text{ being angle at apex}$$

Carousel cone: $x = (0.083 \cos (6\theta) + 25) \cos t$

$$y = (0.083 \cos (6\theta) + 25) \sin t$$

$$z = - (0.083 \cos (6\theta) + 25) (1/63) \quad \leftarrow \text{bottom nappe}$$

(maybe an inch or two of slant per Elizabeth-height?)



Enter formulas for x, y, and z in terms of t in ordinary syntax. For example:

$$t \cdot \sin(t^2 + 1) - t$$

Mouse over the SYNTAX button for

$$x = (3 \cdot \cos(6 \cdot t) + 25) \cdot \cos(t)$$

$$y = (3 \cdot \cos(6 \cdot t) + 25) \cdot \sin(t)$$

$$z = -(3 \cdot \cos(6 \cdot t) + 25) \cdot (1/63)$$

Enter the range for t. (Numerical entries)

$$t_{\min} = 0$$

$$t_{\max} = 10 \cdot \pi$$



After you enter or change the above settings, click **GO**

again, wiggle exaggerated for effect

