Connect Quiz 2

Q1

Please round your answer to three decimals and remember answer is in radians.

Use the cross product to determine the angle between $a = 4i + 2k$ and $b = 5j + 9k$.

Your Answer:

$\langle 4, 0, 2 \rangle \quad \langle 0, 5, 9 \rangle$

$$\text{cost} = \frac{a \cdot b}{|a|\,|b|} = \frac{18}{\sqrt{20}\,\sqrt{25+81}} = \frac{18}{\sqrt{20}\,\sqrt{106}}$$

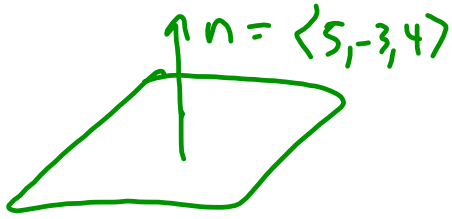
$$t = \cos^{-1}\left(\frac{18}{\sqrt{2120}}\right)$$

$$t = 1.164$$

Q4

Find the parametric equations for the line passing through $(3, 2, -2)$ and normal to the plane $5x - 3y + 4z = 12$.

$x =$, $y =$, $z =$



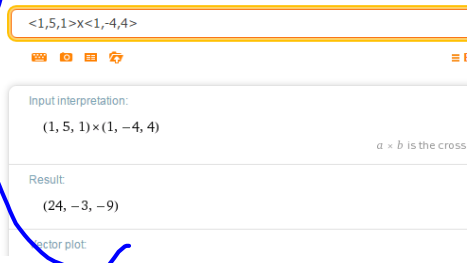
$$x = 3 + 5t$$
$$y = 2 + -3t$$
$$z = -2 + 4t$$

10. 5 Number 5

Find the line of intersection of the planes: $x + 5y + z = 5$ and $x - 4y + 4z = 14$.

- A. $x = -8t + 5$, $y = t$ and $z = 3t + 3$
- B. $x = -8t + 2$, $y = t$ and $z = 3t - 3$
- C. $x = -8t + 2$, $y = t$ and $z = 3t + 3$
- D. $x = 8t + 2$, $y = t$ and $z = 3t + 3$

$\langle 1,5,1\rangle \times \langle 1,-4,4\rangle$



<24,-3,-9>

x+z=5

x+4z=14

y=0

3z=9 z=3

x=2

<8,-1,-3>

<-8,1,3>

x=2-8t

y=t

z=3+3t

#18

Find the distance between the two planes given by $2x - y - z = 10$ and $2x - y - z = 3$.

Point

$(0,0,-10)$

Distance between

$(0,0,-10)$ & $2x - y - z - 3 = 0$

A B C

$$D = \frac{|Ax+By+Cz-D|}{\sqrt{A^2+B^2+C^2}} = \frac{|2(0)+-(0)-1(-10)-3|}{\sqrt{6}} = 7/\sqrt{6}$$

Vector Valued Function

ex

$\vec{F}(t) = \langle -8t+2 \;,\; t \;,\; 3t + t \rangle$

LINE

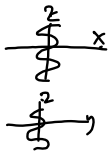
Match the vector−valued function

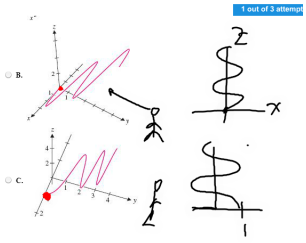
$f(t) = \langle 5\sin^3 t, 5\cos^3 t, t \rangle$

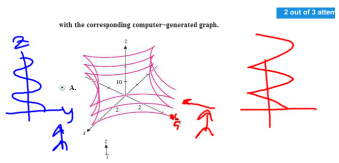
<0, 5, 0>

$X = \sin^3 t$

$Y = \cos^3 t$







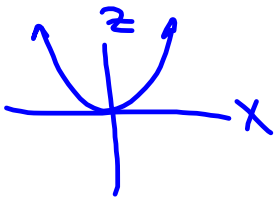
Choose the sketch of the curve traced out by the given vector−valued function.

$\mathbf{r}(t) = \langle t, 1, 3t^2 \rangle$

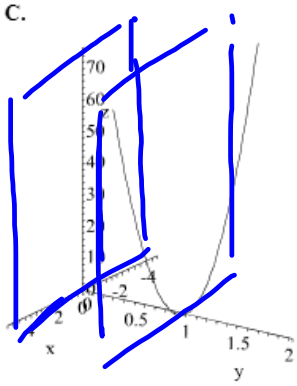
$X = t$

$Z = 3t^2$

$= 3x^2$



C.



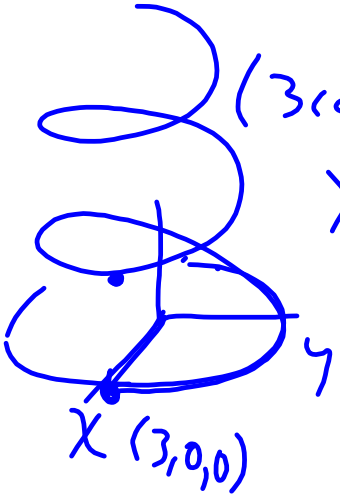
Choose the sketch of the curve traced out by the given vector–valued function.

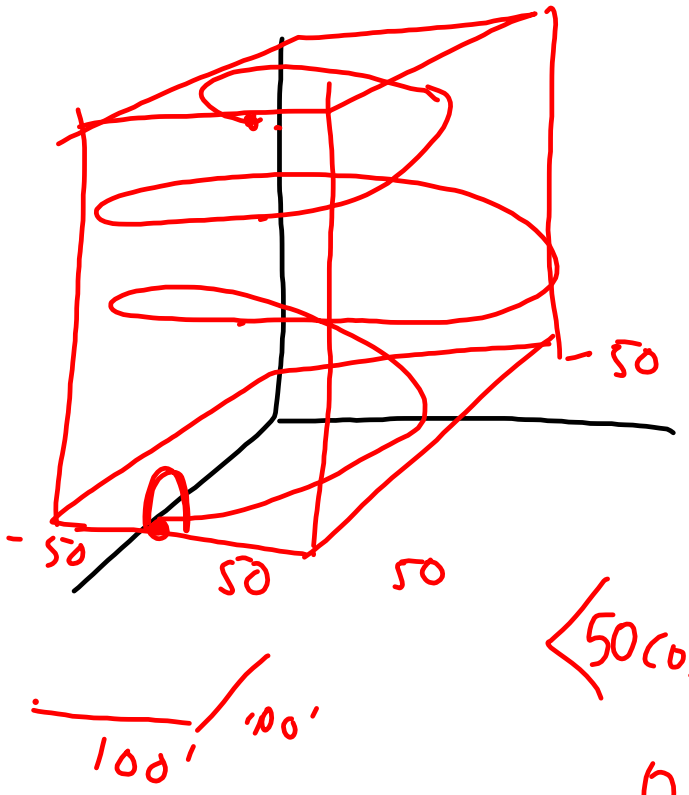
$$\mathbf{r}(t) = \langle 3\cos t, 3\sin t, t \rangle$$

$(3\cos t)^2 + (3\sin t)^2 = 9$

$x^2 + y^2 = 9$

At $t=0$ $\vec{r}(0) = \langle 3, 0, 0 \rangle$





12'

240' Tall

20 Slinky

100'

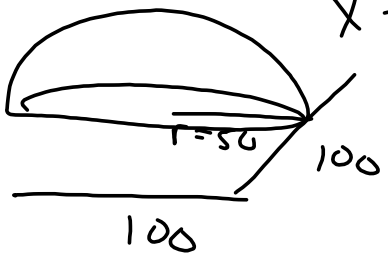
100'

$\langle 50\cos t, 50\sin t, \frac{12t}{2\pi} \rangle$

$0 \le t \le 40\pi$

$\frac{12t}{2\pi} = 240$

Dome on Top



$x^2+y^2+z^2=50^2$

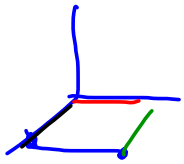
$z=\sqrt{50^2-x^2-y^2}$

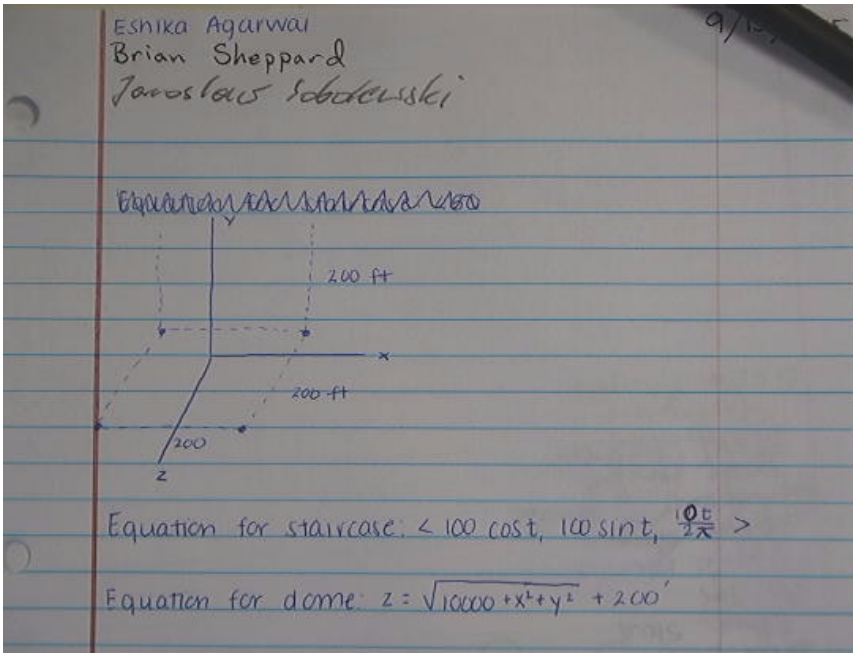
Raise to Top

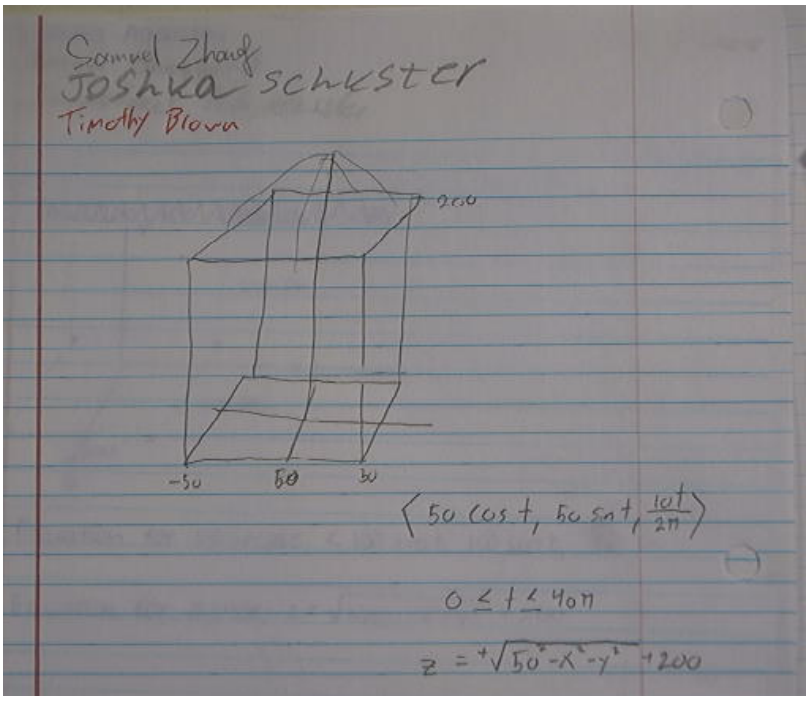
$z=\sqrt{50^2-x^2-y^2}+240$

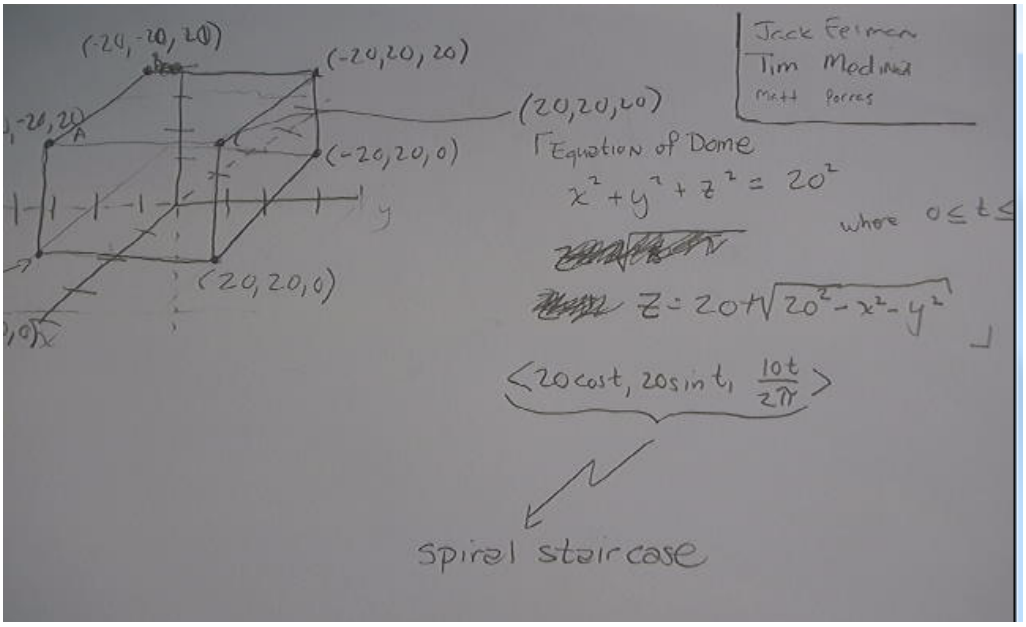
$\vec{r}(t)=\langle 100, t, 0\rangle$

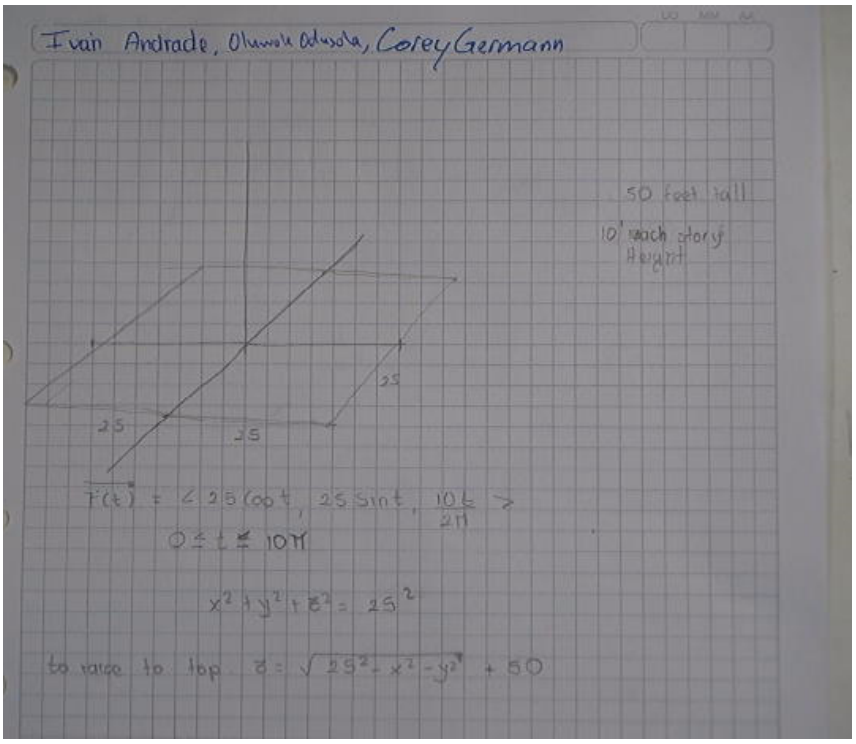
$0\le t\le 100$

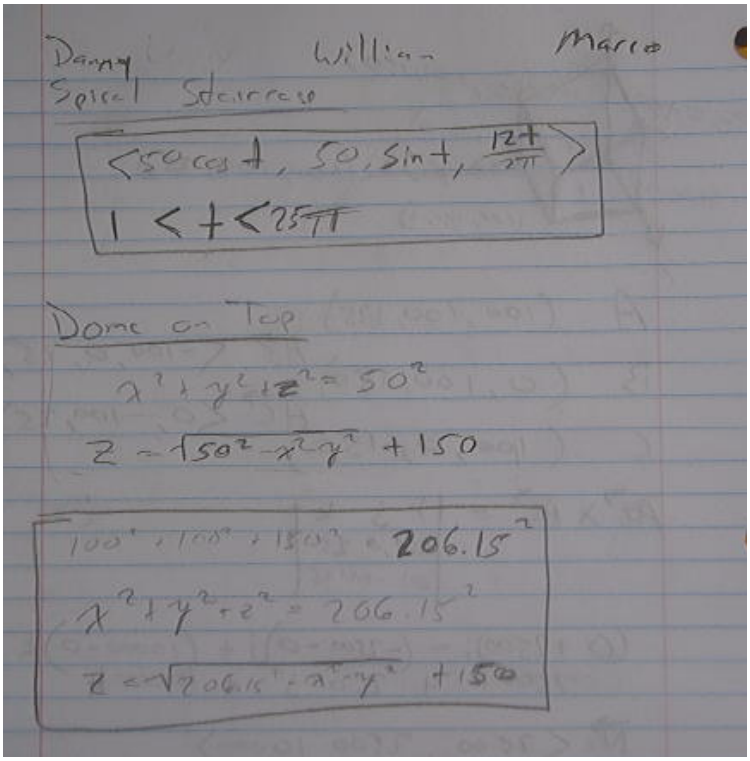


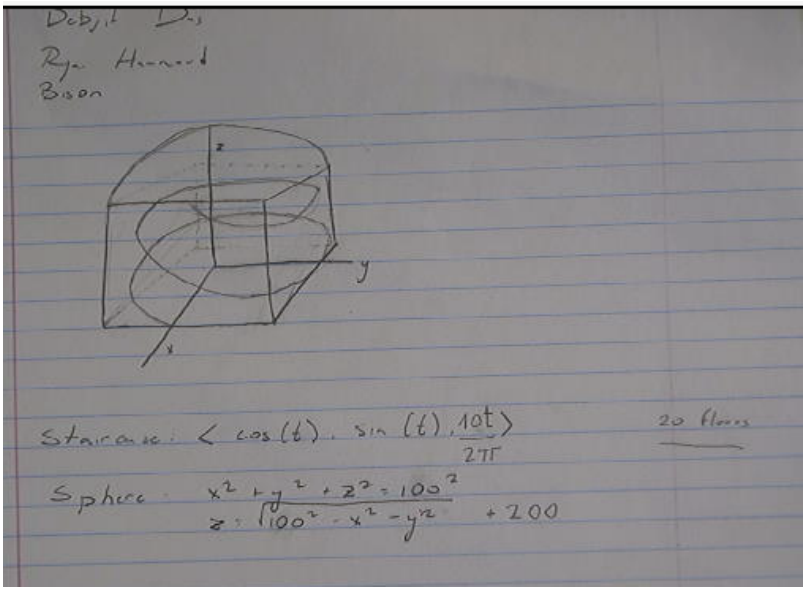



Samuel Zhang
Joshua schuster
Timothy Brown
200
-50
50
50
$\langle 50\cos t, 50\sin t, \frac{10t}{2\pi} \rangle$
$0 \le t \le 40\pi$
$z = \sqrt{50^2 - x^2 - y^2} + 200$


(-20,-20,20)
(-20,20,20)
(20,20,20)
(-20,20,0)
(20,20,0)
Jack Feiman
Tim Medina
Matt Porres
Equation of Dome
$x^2 + y^2 + z^2 = 20^2$
where $0 \le t \le$
$z = 20 + \sqrt{20^2 - x^2 - y^2}$
$\langle 20\cos t, 20\sin t, \frac{10t}{2\pi} \rangle$
spiral staircase


Ivan Andrade, Olumide Odusola, Corey Germann
50 feet tall
10' each story
Height
25
25
25
$\vec{r}(t) = \langle 25\cos t, 25\sin t, \frac{10t}{2\pi} \rangle$
$0 \le t \le 10\pi$
$x^2 + y^2 + z^2 = 25^2$
to raise to top $z = \sqrt{25^2 - x^2 - y^2} + 50$


Danny
William
Mario
Spiral Staircase
$\langle 50\cos t, 50, \sin t, \frac{12t}{2\pi} \rangle$
$1 < t < 25\pi$
Dome on Top
$x^2 + y^2 + z^2 = 50^2$
$z = \sqrt{50^2 - x^2 - y^2} + 150$
$100^2 + 100^2 + 150^2 = 206.15^2$
$x^2 + y^2 + z^2 = 206.15^2$
$z = \sqrt{206.15^2 - x^2 - y^2} + 150$


Debjit Das
Ryan Howard
Bison
z
y
x
Staircase: $\langle \cos(t), \sin(t), \frac{10t}{2\pi} \rangle$
20 floors
Sphere $x^2 + y^2 + z^2 = 100^2$
$z = \sqrt{100^2 - x^2 - y^2}$ + 200