Math 32A, Winter 2019 **WS - Week 4** **Full Name:**

1. Find the point at which the line $\mathbf{r}(t) = \langle 2-t, 1+3t, 4t\rangle$ intersects the plane $2x-y+z=2$.

2. Find an equation of the plane that is perpendicular to the plane $x+y-2z=1$ and contains the line of intersection of the two planes $x-z=1$ and $y+2z=3$.

3. Parametrize the intersection of the surfaces $x^2+y^2=9$ and $z=xy$ using a single parametrization.

4. Two particles travel along the space curves $\mathbf{r}(t) = \langle t, t^2, t^3 \rangle$ and $\mathbf{q}(t) = \langle 1 + 2t, 1 + 6t, 1 + 14t \rangle$. Do the particles collide? Do their paths intersect?

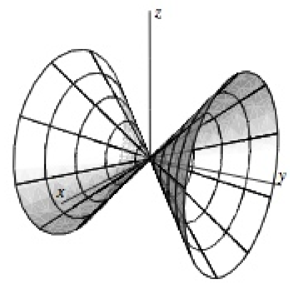
5. Sketch the curve with the vector equation $\mathbf{r}(t) = \langle t, \sin(2t), \cos(2t) \rangle$. Draw an arrow to indicate the direction a particle with this parametrization would travel.

6. Find parametric equations for the tangent line to the helix $\mathbf{r}(t) = \langle 2\cos t, \sin t, t \rangle$ at the point $(0, 1, \pi/2)$.

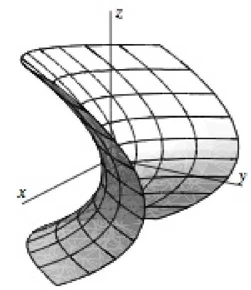
7. Choose the picture that each equation describes.

(a) $z = \cos(x - y)$ ________ (b) $x^2 - y - z^2 = 0$ ________ (c) $x^2 - y + z^2 = 1$ ________

(d) $x^2 - y^2 + z^2 = 0$ ________ (e) $x^2 - y^2 + z^2 = -1$ ________



(A)



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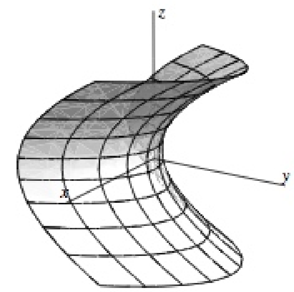

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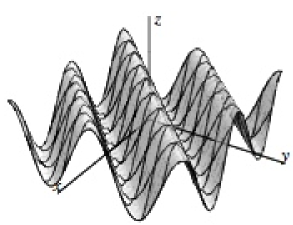

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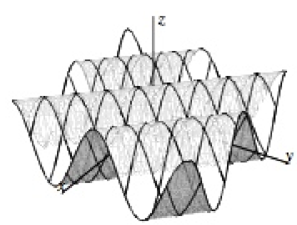

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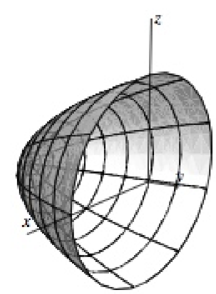

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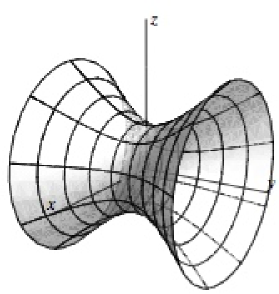

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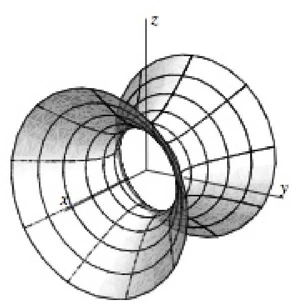

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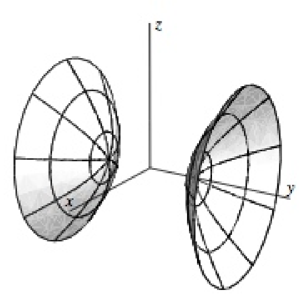

(I)