

## Review Practice: Chapters 12 & 13

1. Find the equation of the plane through  $A(0, 1, -1)$ ,  $B(1, 0, -1)$ , and  $C(-1, 1, 0)$ .
2. Parametrize the line perpendicular to the plane with normal vector  $\langle 0, 1, 1 \rangle$  through the point  $(1, 2, 3)$ .
3. Find the angle between the two planes from problem 1 and 2 above. Are they orthogonal?
4. Sketch:
  - (a)  $z = 4 - x$
  - (b)  $y^2 + z^2 = 9$
  - (c)  $z = 4 - x^2 - y^2$
  - (d)  $x = z^2 + 2$

5. Sketch  $\mathbf{r}(t) = \langle \cos t, \sin t, -t \rangle$

6. Find  $\lim_{t \rightarrow 0} \left\langle \frac{\sin t}{t}, t^2, \ln(t+1) \right\rangle$

7. Find the derivative of  $\mathbf{r}(t) = \langle \sin^2 t, e^{4t} + 1, 3t^4 + t^2 \rangle$

8. Find the arc length of  $\mathbf{r}(t) = \langle \sin(t^2), \cos(t^2), 2t^3 \rangle$  for  $0 \leq t \leq 1$ .