

Lines in 2 - Space practice:

- 1) Determine vector and parametric equations for the line containing points P(-1,5) and Q(6,11). Determine three other points on this line. Where does this line cross the x-axis?  
 $\{\vec{p} = (-1,5) + k(7,6), k \in \mathbb{R}\}$  {answers vary}  $\{(-41/6,0)\}$
- 2) Given  $\ell_1 : \vec{r} = (3,4) + k(2,-1)$  and  $\ell_2 : \vec{r} = (-9,8) + m(-6,3)$ . Do these represent the same line?  
 $\{\ell_1 \parallel \ell_2\}$
- 3) Find the scalar equation of the line with  $\vec{n} = (2,-5)$ , passing through A(1,3).  
 $\{2x - 5y + 13 = 0\}$
- 4) Given  $\begin{cases} x = 3 - 2t \\ y = -4 + t \end{cases}$ , find a scalar equation for the line.  
 $\{x + 2y + 5 = 0\}$
- 5) Given  $2x - 3y + 6 = 0$ , find a vector equation for the line.  
 $\{(x, y) = (-3,0) + t(3,2)\}$
- 6) Convert each of the following equations to the requested form.
  - a)  $\vec{r} = (2,-2) + t(-2,5)$  to scalar form.  
 $\{5x + 2y - 6 = 0\}$
  - b)  $2x - y - 6 = 0$  to vector form.  
 $\{(x, y) = (3,0) + k(1,2)\}$
- 7) Find a direction vector for a line which is:
  - a) perpendicular to  $3x + 7y - 21 = 0$ .  $\{(3,7)\}$
  - b) parallel to  $(x, y) = (-1,0) + k(3,-8)$   $\{(3,-8)\}$
  - c) parallel to  $2x - 5y + 13 = 0$   $\{(5,2)\}$
  - d) perpendicular to  $\frac{x-1}{3} = \frac{y+3}{5}$   $\{(5,-3)\}$
- 8) Find the symmetric equation of the line through  $P(-1,5)$  with slope  $-7/5$ .  
 $\left\{ \frac{x+1}{5} = \frac{y-5}{-7} \right\}$