Please do not write in the margins of the page!

For the linear equation $y = -2x + 7$,

1) Find the slope and the y-intercept. Give the y-intercept as a point.

   The slope is -2 and the y-intercept is $(0, 7)$

2) Find the equation of a line which is parallel to this one and passes through $(-1, 5)$

   The slope of the parallel line is also -2. There are now two ways you could find the equation:
   • Method using the slope-intercept form: since the slope is -2 we know that the equation has the form $y = -2x + b$ and we use the given point to find b
   $5 = -2(-1) + b$
   $5 = 2 + b$
   $3 = b$
   So the equation of the parallel line is $y = -2x + 3$
   • Method using the point-slope form of the line: There are two versions of the point-slope form. The more common one is $y - y_A = m(x - x_A)$, or the alternate version which is used in the WeBWorK solutions, which is $y = m(x - x_A) + y_A$. I will use the second one here.
   $y = -2\,(x - (-1)) + 5$
   $y = -2\,(x + 1) + 5$
   $y = -2x - 2 + 5$
   $y = -2x + 3$

3) Find the equation of a line which is perpendicular to this one and passes through $(6, 1)$

The slope of the perpendicular line is $-\frac{1}{2}$

I will show how to use the slope-intercept form here:

$y = -\frac{1}{2}x + b$

$1 = \left(-\frac{1}{2}\right)(6) + b$

$1 = -3 + b$

$4 = b$

So the equation of the perpendicular line is $y = -\frac{1}{2}x + 4$