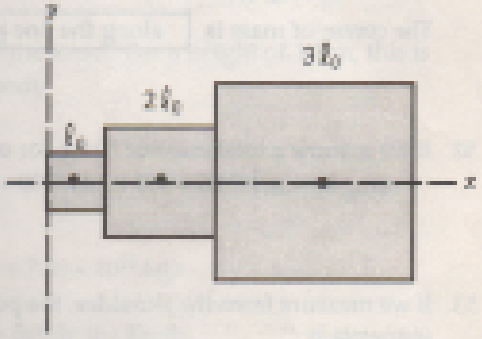
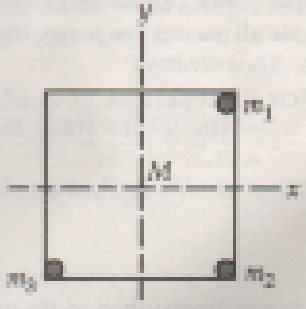
46. We choose the origin at the carbon atom. The center of mass will lie along the line joining the atoms:
$x_{CM} = (m_C x_C + m_O x_O)/(m_C + m_O)$
$= [0 + (16\text{ u})(1.13 \times 10^{-10}\text{ m})]/(12\text{ u} + 16\text{ u}) =$ $\boxed{6.5 \times 10^{-11}\text{ m}}$ from the carbon atom.

47. We choose the origin at the front of the car:
$x_{CM} = (m_{car}x_{car} + m_{front}x_{front} + m_{back}x_{back})/(m_{car} + m_{front} + m_{back})$
$= [(1050\text{ kg})(2.50\text{ m}) + (140\text{ kg})(2.80\text{ m}) + (210\text{ kg})(3.90\text{ m})]/(1050\text{ kg} + 140\text{ kg} + 210\text{ kg})$
$=$ $\boxed{2.74\text{ m}}$ from the front of the car.

48. Because the cubes are made of the same material, their masses will be proportional to the volumes:
m_1, $m_2 = 2^3 m_1 = 8m_1$, $m_3 = 3^3 m_1 = 27m_1$.
From symmetry we see that $y_{CM} = 0$.
We choose the x-origin at the outside edge of the small cube:
$x_{CM} = (m_1x_1 + m_2x_2 + m_3x_3)/(m_1 + m_2 + m_3)$
$= [m_1(\frac{1}{2}\ell_0) + 8m_1[\ell_0 + \frac{1}{2}(2\ell_0)] +$
$27m_1[\ell_0 + 2\ell_0 + \frac{1}{2}(3\ell_0)]]/(m_1 + 8m_1 + 27m_1)$
$= 138\ell_0/36$
$=$ $\boxed{3.83\ell_0 \text{ from the outer edge of the small cube.}}$



49. We choose the origin at the center of the raft, which is the CM of the raft:
$x_{CM} = (Mx_{raft} + m_1x_1 + m_2x_2 + m_3x_3)/(M + m_1 + m_2 + m_3)$
$= [0 + (1200\text{ kg})(9.0\text{ m}) + (1200\text{ kg})(9.0\text{ m}) +$
$(1200\text{ kg})(-9.0\text{ m})]/[6200\text{ kg} + 3(1200\text{ kg})]$
$=$ $\boxed{1.10\text{ m (East)}}$.
$y_{CM} = (My_{raft} + m_1y_1 + m_2y_2 + m_3y_3)/(M + m_1 + m_2 + m_3)$
$= [0 + (1200\text{ kg})(9.0\text{ m}) + (1200\text{ kg})(-9.0\text{ m}) +$
$(1200\text{ kg})(-9.0\text{ m})]/[6200\text{ kg} + 3(1200\text{ kg})]$
$=$ $\boxed{-1.10\text{ m (South)}}$.



50. We choose the coordinate system shown. There are 10 cases.
$x_{CM} = (5mx_1 + 3mx_2 + 2mx_3)/(10m)$
$= [5(\frac{1}{2}\ell) + 3(\ell + \frac{1}{2}\ell) + 2(2\ell + \frac{1}{2}\ell)]/(10)$
$= 1.2\ell$.
$y_{CM} = (7my_1 + 2my_2 + my_3)/(10m)$
$= [7(\frac{1}{2}\ell) + 2(\ell + \frac{1}{2}\ell) + (2\ell + \frac{1}{2}\ell)]/(10)$
$= 0.9\ell$.
The CM is $\boxed{1.2\ell \text{ from the left, and } 0.9\ell \text{ from the back}}$ of the pallet.