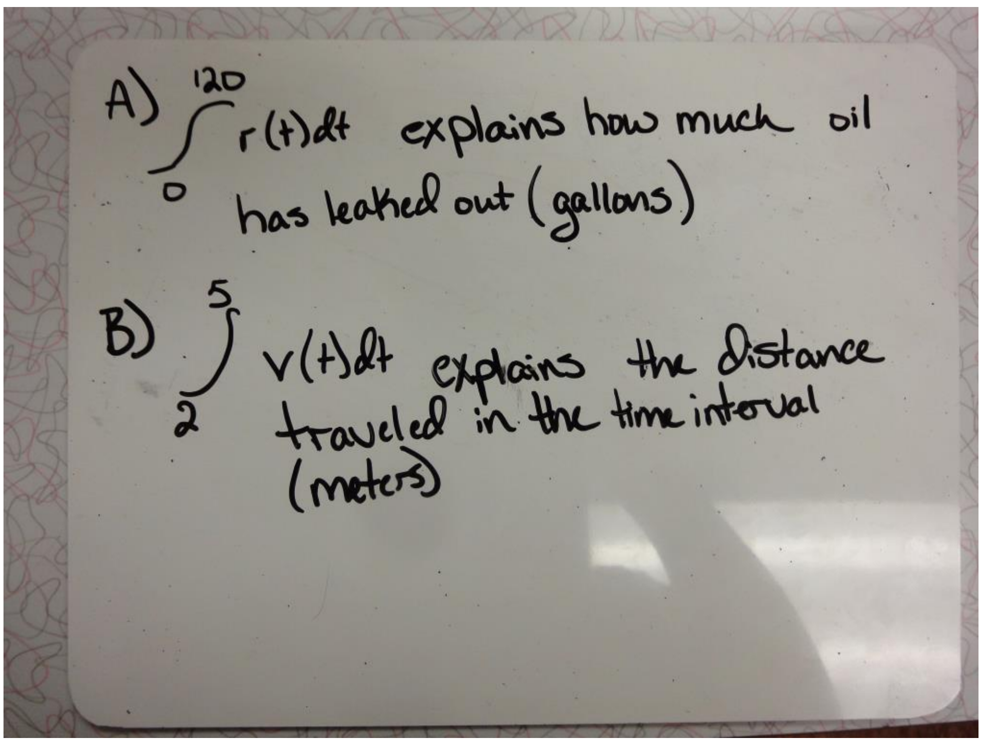
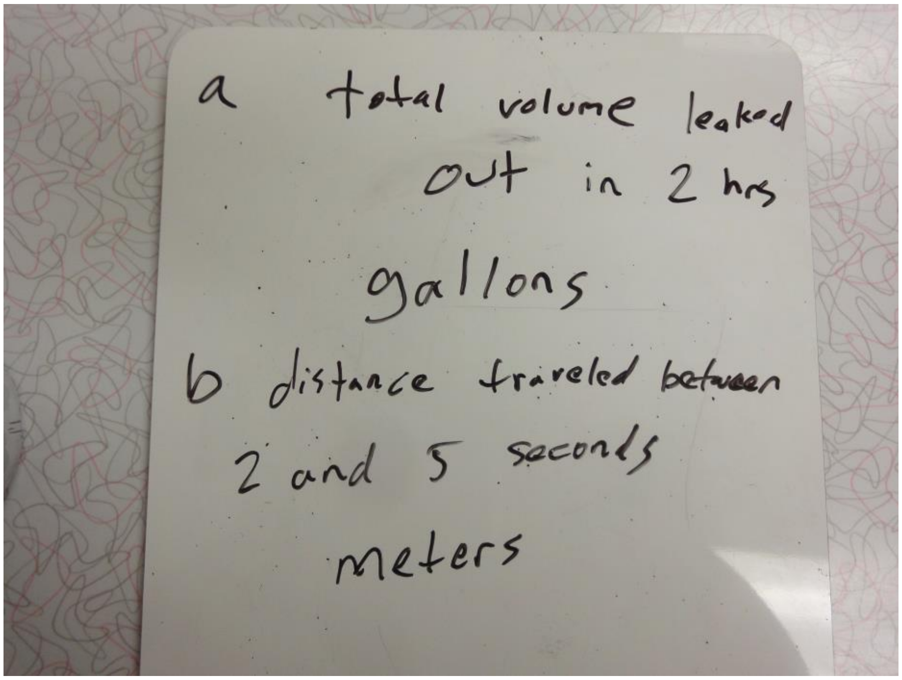
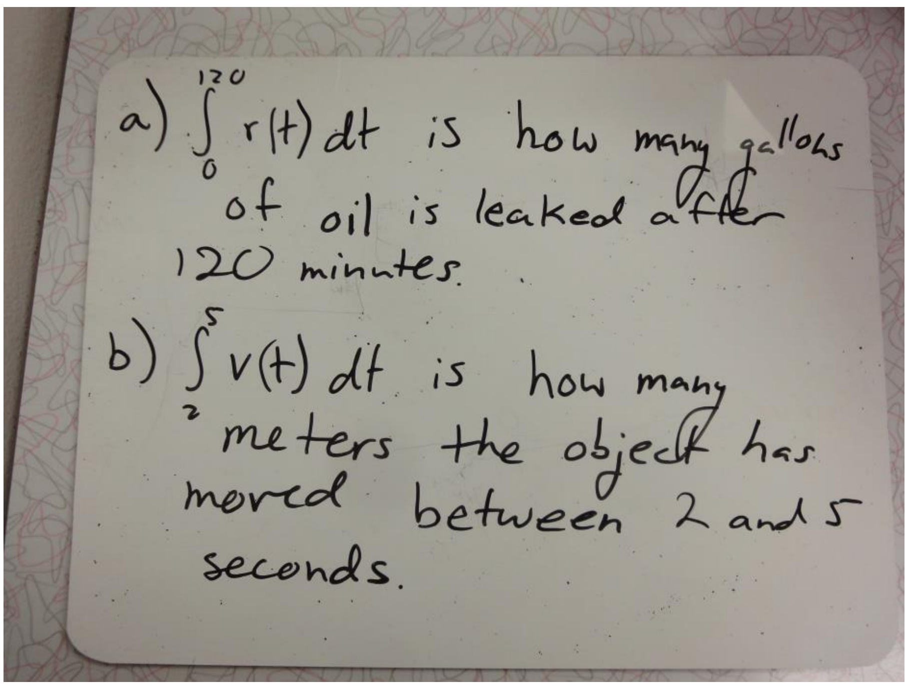
One solution to $\int \frac{1}{1-\cos x}\,dx$ (using the conjugate idea):

$$
\begin{aligned}
\int \frac{1}{1-\cos x}\,dx &= \int \frac{1}{1-\cos x}\cdot\frac{1+\cos x}{1+\cos x}\,dx \\
&= \int \frac{1+\cos x}{1-\cos^2 x}\,dx \\
&= \int \frac{1+\cos x}{\sin^2 x}\,dx \\
&= \int \left(\frac{1}{\sin^2 x}+\frac{\cos x}{\sin^2 x}\right)dx \\
&= \int \left(\frac{1}{\sin^2 x}+\frac{1}{\sin x}\cdot\frac{\cos x}{\sin x}\right)dx \\
&= \int \left(\csc^2 x+\csc x\cot x\right)dx \\
&= \boxed{-\cot x-\csc x+C}
\end{aligned}
$$

Solutions to interpreting the meaning of an integral:







As was mentioned in class for part (b), $\int_2^5 v(t)\,dt = \int_2^5 s'(t)\,dt = s(5) - s(2)$. Thus, the integral doesn't necessarily represent the distance traveled (unless the object moves in the same direction from $t = 2$ to $t = 5$). Since the object may turn around and travel in the opposite direction, a more accurate description of $\int_2^5 v(t)\,dt$ would be that it measures the **displacement** over this 3 second period.