1. $\boxed{48 \text{ g}}$

2. Organize the given information into a table that looks like the one below:

Alloy	Ounces	%Aluminum	Pure Aluminum
1	x	35	$0.35x$
2	$30 - x$	65	$0.65(30 - x)$
$1 + 2$	30	55	$0.55(30)$

The total amount of pure aluminum from the first two solutions should be equal to the amount of pure aluminum in the final solution, giving us the following equation:

$$\begin{aligned} 0.35x + 0.65(30 - x) &= 0.55(30) \\ 0.35x + 19.5 - 0.65x &= 16.5 \\ 19.5 - 0.3x &= 16.5 \\ 3 &= 0.3x \\ x &= 10 \end{aligned}$$

This means that we need $\boxed{\text{10 oz of 35\% and 20 oz of 65\%}}$.

3. The second cyclist will overtake the first when the distances they've travelled are equal. We will use this fact to construct an equation.

The first cyclist travels for 2 hours at a rate of 30 miles per hour before the second cyclist leaves. This means that by that time the second cyclist begins, the first cyclist has already travelled $2 \cdot 30 = 60$ miles. Now if we let t be time travelled, in hours, then we get the following equation:

$$\begin{aligned} 35t &= 30t + 60 \\ 5t &= 60 \\ t &= \boxed{12} \end{aligned}$$

4. $\boxed{3.75 \text{ quarts}}$

5. $\boxed{22 \text{ and } 40}$

6. $\boxed{4 \text{ h}}$

7. $\boxed{150 \text{ lbs at \$2.10, 150 lbs at \$1.90}}$

8. $\boxed{36, 44 \text{ knots/hr}}$

9. What we're basically asking is how much of a mixture of 40% antifreeze should be mixed with a mixture of 100% antifreeze in order to make 20 quarts of 50% antifreeze. We will need to organize the information into a table as is done below:

Mixture	Quarts	% Antifreeze	Pure Antifreeze
1	x	100	x
2	$20-x$	40	$0.4(20-x)$
$1+2$	20	50	$0.5(20)$

The total amount of pure antifreeze in the first and second mixtures should equal the amount of pure antifreeze in the final mixture, giving us the following equation:

$$\begin{aligned} x+0.4(20-x) &= 0.5(20) \\ x+8-0.4x &= 10 \\ 0.6x &= 2 \\ x &= \boxed{3\frac{1}{3}} \end{aligned}$$

10. $\boxed{\text{800 pounds milk and 200 pounds cream}}$