

1. $\boxed{8000, 6000}$

2. $\boxed{27350, 27950}$

3. $\boxed{12.5 \text{ miles}, 15 \text{ miles}}$

4. $\boxed{10,200 \text{ at } 3,800}$

5. $\boxed{1,560 \text{ plane}, 3,120 \text{ rocket}}$

6. $\boxed{2800 \text{ at } 8\%, 10000 \text{ at } 7\%}$

7. $\boxed{18000, 22000}$

8. This question is very easy to misread. Let x be the number of cars presently on the road. Then $\frac{1}{5}x - 10,000$ is the number of cars that should be reduced. We are given that "if the present number of cars on the roads less than those which should not be on the roads is 480,000," which is $x - (\frac{1}{5}x - 10,000) = 480,000$. So we solve for x :

$$x - \frac{1}{5}x + 10,000 = 480,000$$

$$\frac{4}{5}x = 470,000$$

$$x = \frac{5}{4} \cdot 470,000 = \boxed{587,500}$$

Which means that $\frac{1}{5}x - 10,000 = \frac{1}{5}(587,500) - 10,000 = 117,500 - 10,000 = \boxed{107,500}$

9. $\boxed{32000, 8000}$

10. let x be the number of oil companies presently. Then the increased number is $\frac{1}{5}x - 2$. We are given $x + \frac{1}{5}x - 2 = 22$. Solve.

$$x + \frac{1}{5}x - 2 = 22$$

$$\frac{6}{5}x = 24$$

$$x = \frac{5}{6} \cdot 24 = 20$$

(a) asks for the value of x , which is $\boxed{20}$.

(b) the increase in oil companies is $22 - 20 = 2$, and if each of these used the energy saving device, they would save $2 \cdot 42 = \boxed{84 \text{ million gallons of gas}}$.

(c) there are 20 companies now, and if each of them used it, they would save $20 \cdot 42 = \boxed{840 \text{ million gallons of gasoline}}$