Name:

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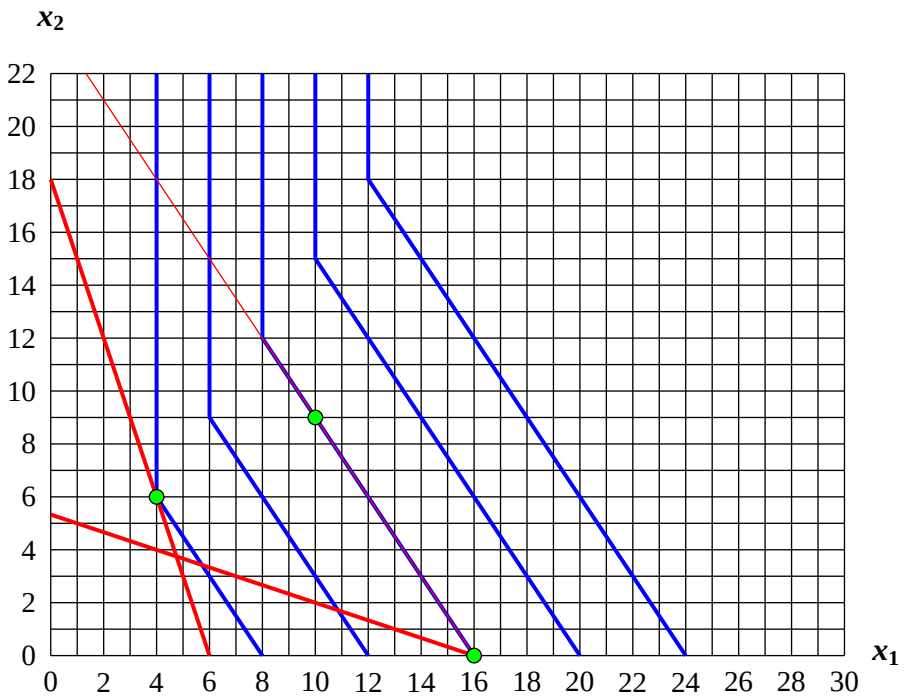
All questions must be answered on this test form!
For each question you must show your work and (or) provide a clear argument.
All graphs must be accurate to get credit.

Question 1 Consumer preferences are depicted below:



1. We must have MRS $= p_1/p_2$. Thus, $3/2 = p_1/30$, i.e., $p_1 = 45$.
   Then $\boxed{p_1 = 45, I = 720}$.
2. If prices are $p_1 = 1$, $p_2 = 3$, then it is optimal only to consume good 1. Then the minimum amount of income the person needs to get the same utility as $(8, 14)$ is given by $\boxed{I = 16}$.
3. If $p_1 = 3$ and $p_2 = 1$ and $I = 18$ then $(4, 6)$ is optimal Thus, the optimal consumption is $\boxed{x_1 = 4, x_2 = 6}$.

Question 2

(a) $300 - 60 - 2P = 60 + P$. Thus, $P = 60$. Hence $Q = 120$

the government's tax revenue is 3, 600

(b) We get $300 - 60 - 2P = 60 + 30 + P$. Thus, $P = 50$ and $Q = 140$.

the government's tax revenue is 4,200.

the government's total subsidy payments are 4,200.

(c) Demand is $Q_D(60) = 180$. Therefore $Q_S(60 + s) = 180$, i.e., $120 + s = 180$. Thus, $s = 60$.

The subsidy is $s = 60$.

Question 3

(a) Let $Q_S(P) = a + bP$. Then $\epsilon_S = bP/Q$. Thus, $0.5 = 10b/100$. Hence, $b = 5$. Thus, $100 = Q_D(10) = a + 50$. Hence, $a = 50$.

$\boldsymbol{Q_S(P) = 50 + 5P}$.

(b) Suppose the demand function is given by $Q_D(P) = 20 - 4P$. Thus, $-1 = -4P/(20 - 4P)$, which implies $P = 2.5$

$\boldsymbol{P = 2.5}$.

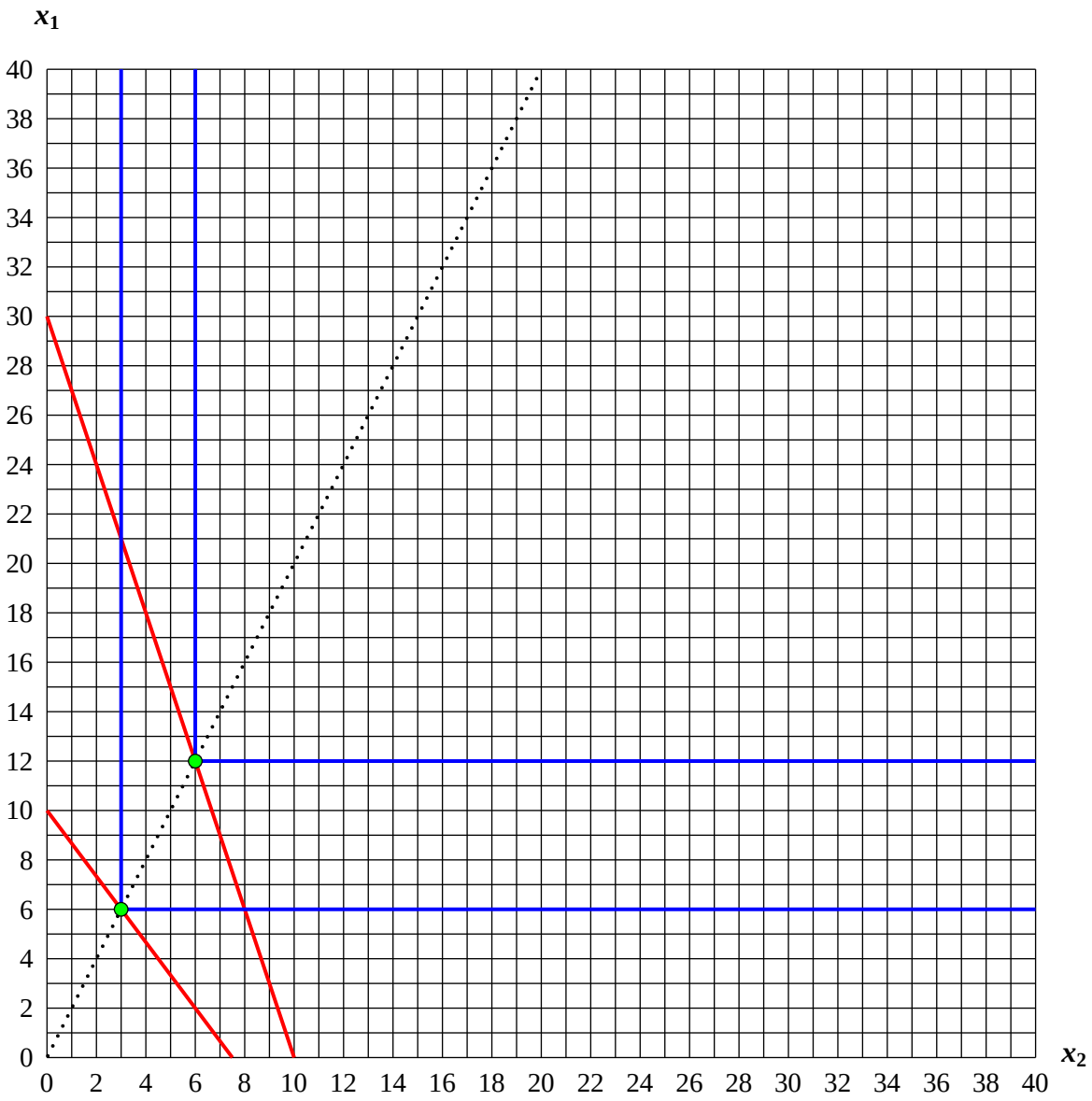
(c) Let $Q_D(P) = a - bP$. Then $-30b/(a - 30b) = -1$, i..e, $a = 60b$. Further, at $P = 10$ demand is 100, i.e., $100 = a - 10b$. Hence $100 = 50b$, i.e., $b = 2$. Thus,

$\boldsymbol{Q_D(P) = 120 - 2P}$.

Question 4

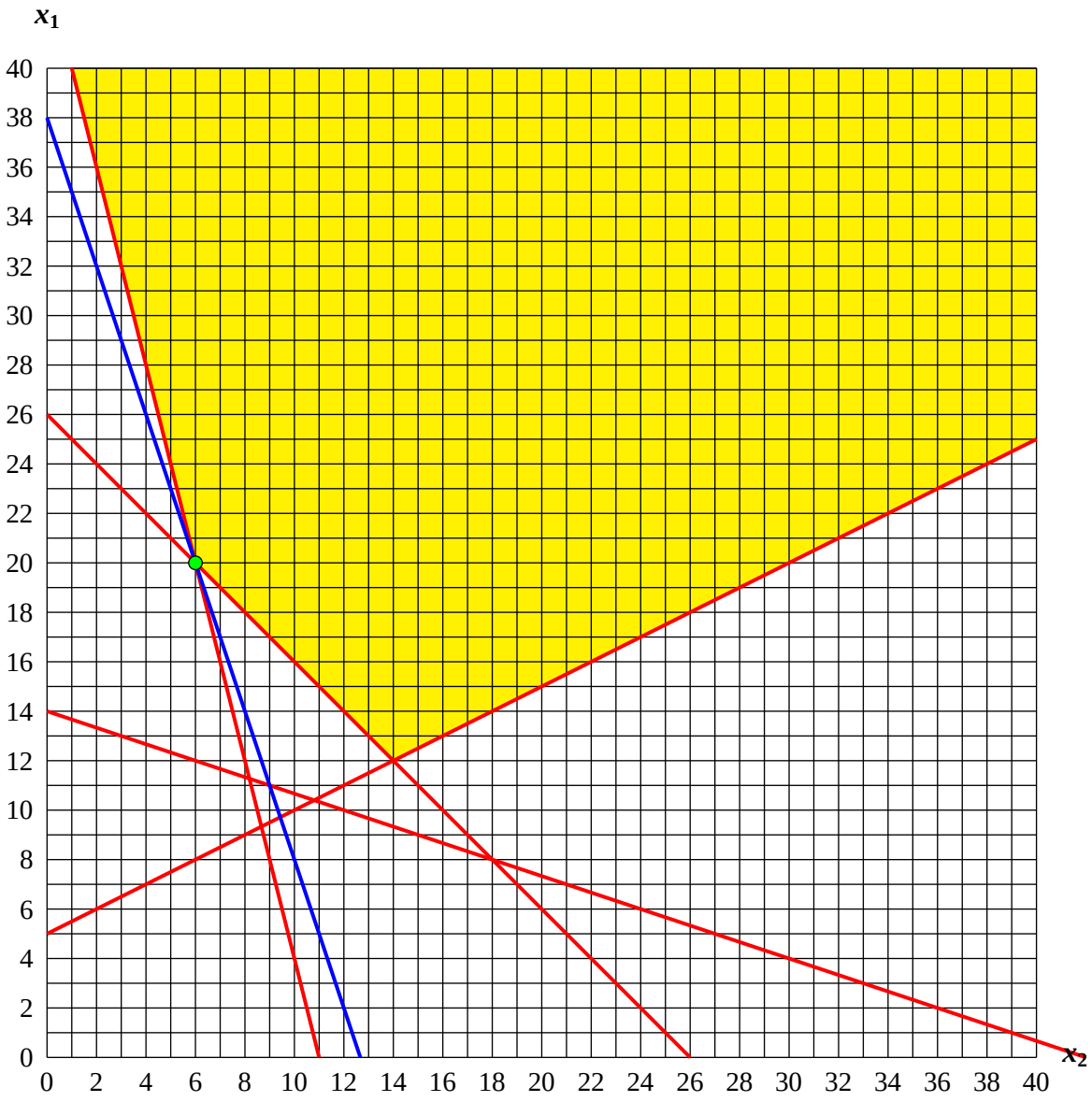
(a) The optimum is $\boxed{x_1 = 6, x_2 = 12}$.

(b) $\boxed{x_1 = 3, x_2 = 6}$.



Question 5 Determine the optimum graphically. *Indicate the feasible set by shading it!*

At an optimum $x_1 = 6$, $x_2 = 20$



Question 6 **Before-tax demand is $x_1 = 40$, $x_2 = 0$**

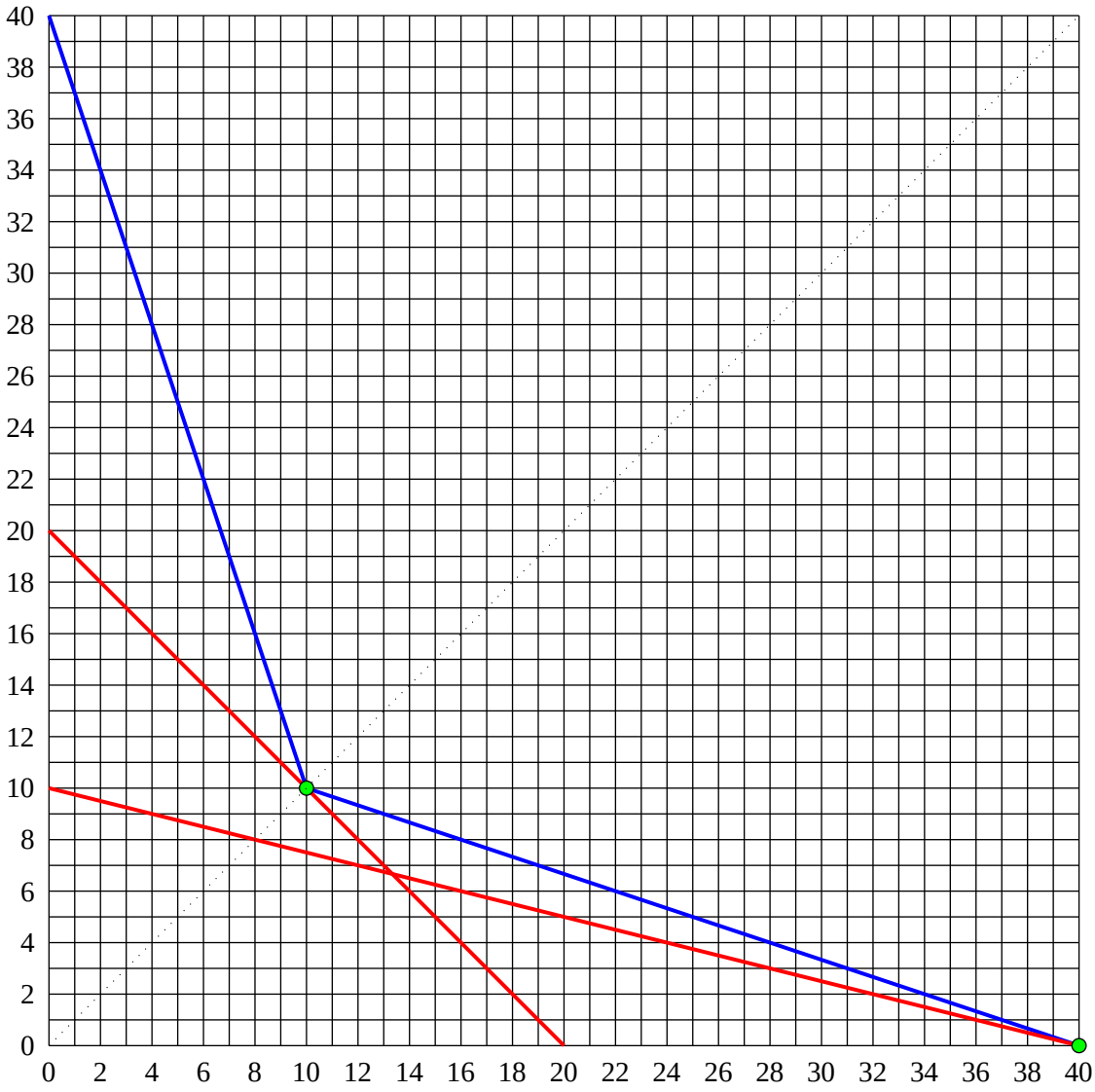
Compensated demand is $x_1 = 10$, $x_2 = 10$

and the cost of this consumption bundle (at after-tax prices) is 80

which would require a subsidy of 40 to the consumer

After the subsidy is introduced, the government's tax revenue is 30

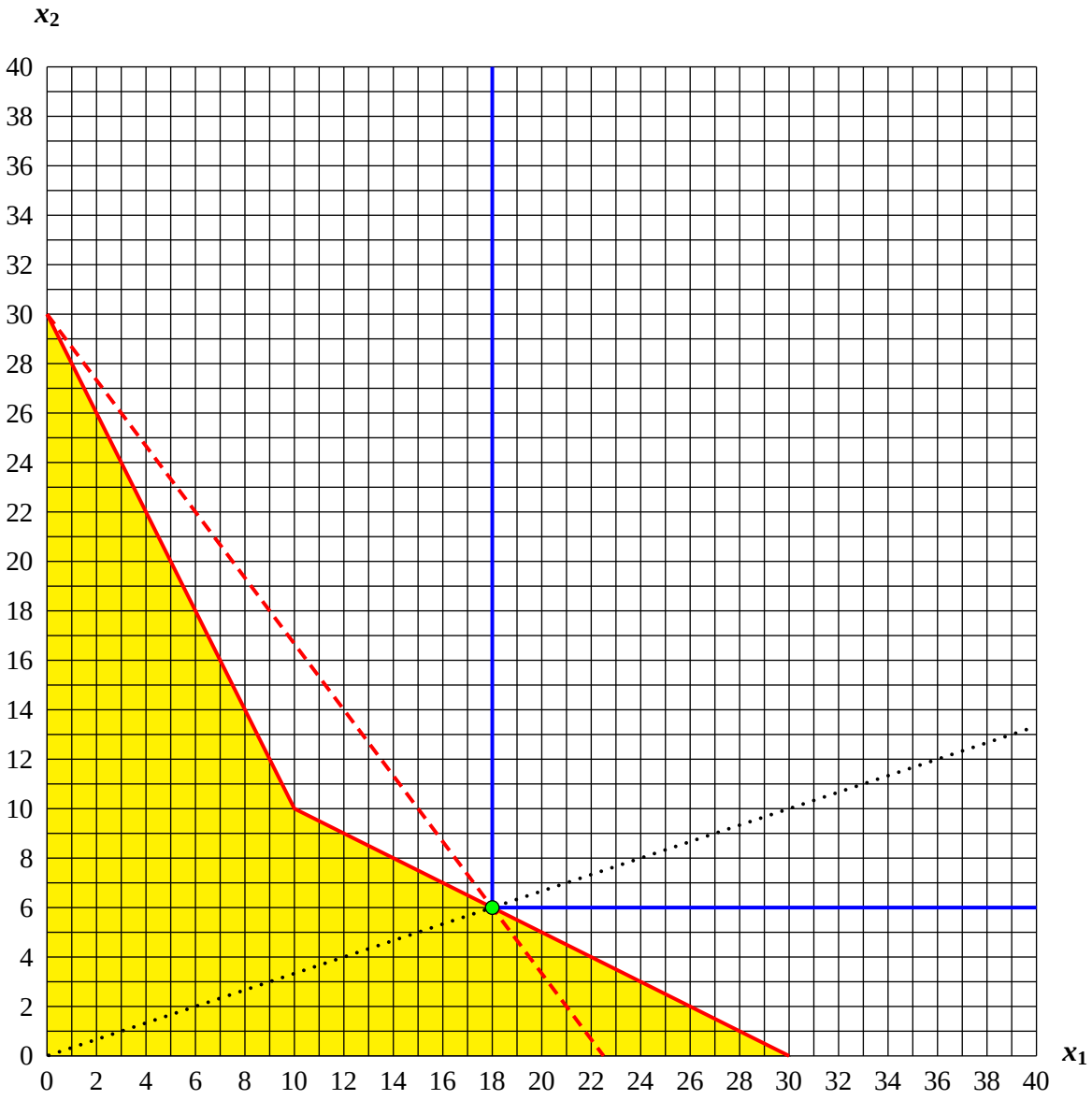
The deadweight loss of the tax is therefore 10



Question 7 **The optimal consumption is $x_1 = 18$ $x_2 = 6$**

At a price of $p_1' = 2.5$, the person would be able to afford $(18, 6)$ which would be the optimal consumption choice.

$p_1' = 1.33$



Question 8 Preferences are depicted below.

optimal consumption is $x_1 = 30$, $x_2 = 0$

The the person needs and income of at least **$I = 81$**.