InsureAll is a monopolist in the market for insurance. There are two types of potential customers, Type \( a \) and Type \( b \). Both types have the same initial wealth \( W \) and face the same potential loss \( x \). Furthermore, they have the same utility-of-money function \( U(m) \) such that \( U'(m) > 0 \) and \( U''(m) < 0 \) (for all \( m \geq 0 \)). However, they differ in the probability of suffering a loss. Type \( a \) customers will incur a loss with probability \( p_a \), while Type \( b \) will incur a loss with probability \( p_b \), with \( 0 < p_a < p_b < 1 \). While each consumer knows her own type, InsureAll cannot tell whether an applicant is of one type or the other. There are 1,000 consumers of each type. Assume that, if a potential customer is indifferent between insuring and not insuring, then she will choose to insure.

In the following diagram the thick indifference curves are the indifference curves of one type and the thin indifference curves are those of the other type (I am not telling you which is which, because you have to figure it out yourself). \( N \) is the no insurance point and \( A, B, C \) and \( D \) are possible insurance contracts.

Let
\[
W = 36,000;
\]
\[
x = 12,000;
\]
\[
p_a = \frac{1}{60};
\]
\[
p_b = \frac{1}{30};
\]
\[
a1 = b1 = 34,600;
\]
\[
a2 = 35800;
\]
\[
b2 = 35,600 ;
\]
\[
c1 = 35,400;
\]
\[
d1 = 35,100;
\]
\[
d2 = 35,700.
\]

(a) Give the coordinates of point \( N \).

(b) Describe each of the four contracts \( A, B, C \) and \( D \) in terms of premium and deductible.

While answering questions (c)-(f) below, don’t forget that there are 1,000 potential customers of each type and perhaps not all consumers choose to insure.

(c) What are InsureAll’s expected profits if it decides to offer only contract \( C \)?

(d) What are InsureAll’s expected profits if it decides to offer contracts \( B \) and \( C \) (and no other contract)?

(e) What are InsureAll’s expected profits if it decides to offer contracts \( A, B \) and \( C \) (and no other contract)?

(f) What are InsureAll’s expected profits if it decides to offer contracts \( A, B, C \) and \( D \) (and no other contract)?

(g) Find a full insurance contract that would be purchased by both types (if only this contract were offered) and that would yield zero expected profits from the \( a \) types.

(h) Calculate InsureAll’s expected profits from the full insurance contract of (g) above (assuming that only this contract is offered).