Classification of goods

Given the following demand function:

$$q_1 = p_1^{2-a} p_2^{-2}$$

With $a \in \mathbb{R}$,

1. Find the partial derivatives and classify the good with respect to good 2.
2. Find the values of a such that the good is ordinary.

Solution

1. $$\frac{\partial q_1}{\partial p_1} = (2-a)p_1^{1-a}p_2^{-2}$$

   $$\frac{\partial q_1}{\partial p_2} = (-2)p_1^{2-a}p_2^{-3}$$

   Goods 1 and 2 are complements since the derivative with respect to p_2 is negative.

2. For the good to be ordinary, the derivative $\frac{\partial q_1}{\partial p_1}$ must be negative; that is, it must hold that $a > 2$.