1a) $P_1 = 16 \quad P_2 = 20$

$Q_{S1} = 80 \quad Q_{S2} = 100$

$$\varepsilon_S = \frac{\frac{(Q_2 - Q_1)}{(Q_2 + Q_1)}}{\frac{(P_2 - P_1)}{(P_2 + P_1)}} = \frac{\frac{(100-80)}{(100+80)}}{\frac{(20-16)}{(20+16)}} = \frac{\frac{20}{180}}{\frac{4}{26}} = \frac{\frac{1}{9}}{\frac{2}{13}}$$

$$\varepsilon_S = \frac{13}{18} = 0.72$$

The supply is relativly inelastic

1b) $P_1 = 46 \quad P_2 = 52$

$Q_1 = 380 \quad Q_2 = 420$

$$\varepsilon_c = \frac{\frac{(Q_2 - Q_1)}{Q_1}}{\frac{(P_2 - P_1)}{P_1}} = \frac{\frac{420-380}{380}}{\frac{(52-46)}{46}} = \frac{\frac{40}{380}}{\frac{6}{46}} = \frac{\frac{2}{19}}{\frac{3}{23}} = \frac{46}{57}$$

$$\varepsilon_c = 0.81$$

The goods are substitutes with a relativly inelastic relationship

1c) $I_1 = 42{,}000 \quad I_2 = 40{,}000$

$Q = 620 \quad Q_2 = 500$

$$\varepsilon_i = \frac{\frac{(Q_2 - Q_1)}{(Q_2 + Q_1)}}{\frac{(I_2 - I_1)}{(I_2 + I_1)}} = \frac{\frac{500-620}{500+620}}{\frac{40{,}000-42{,}000}{40{,}000+42{,}000}} = \frac{\frac{-120}{1120}}{\frac{-2000}{82{,}000}} = \frac{\frac{-12}{112}}{\frac{-2}{82}} = \frac{\frac{-3}{28}}{\frac{-1}{41}}$$

$\varepsilon_i = 4.39$

The good is a luxury good that's price is elastic to income

1d) $P_1 = 28 \quad P_2 = 22$

$Q_{D1} = 300 \quad Q_{D2} = 320$

$$\varepsilon_D = \frac{\frac{Q_2 - Q_1}{Q_1}}{\frac{P_2 - P}{P_1}} = \frac{\frac{320-300}{300}}{\frac{22-28}{28}} = \frac{\frac{20}{300}}{\frac{-6}{28}} = \frac{\frac{1}{15}}{\frac{-3}{14}}$$

$\varepsilon_D = -0.31$

The demand is relativly inelastic

2a) $\varepsilon_c = -3.2$

Cereal and milk are compliments because elasticity is negative.

If cereal price decreases by 4% then demand for milk will decrease by 12.8%

2b) $\varepsilon_s = 1.6$

The supply of bread is elastic because elasticity is >1

If price increases by 2% the supply of bread will increase by 3.2%

2c) $\varepsilon_i = 2.5$

Home computers are a luxury good because elasticity >1

If income decreases by 3% demand will decrease

by 7.5%

2d) $\mathcal{E}_d = -0.35$

Demand for cigarettes is inelastic because elasticity is < 1

If price decreases by 6% demand will increase by 2.1%