Aufgabe 3

a) $f_e = 20\% = 0{,}2$

1) $S_e = 10$

$$S_1 = \frac{1}{(1-f_e)+\frac{f_e}{S_e}} = \frac{1}{0{,}8+\frac{0{,}2}{10}} = \frac{1}{0{,}8+0{,}02} = \frac{1}{0{,}82} \approx 1{,}219$$

2) $f_e = 45\% = 0{,}45$, $S_e = 1{,}8$

$$S_2 = \frac{1}{0{,}55+\frac{0{,}45}{1{,}8}} = \frac{1}{0{,}55+0{,}25} = \frac{1}{0{,}8} = 1{,}25$$

$S_2 > S_1$

b) $f_e = x$

$S_e = 7$

$S = 4$

$$S = \frac{1}{(1-f_e)+\frac{f_e}{S_e}}$$

$$4 = \frac{1}{(1-x)+\frac{x}{7}} \quad ; \quad (1-x)+\frac{x}{7} = \frac{1}{4}$$

$$1-\frac{7x}{7}+\frac{x}{7} = \frac{1}{4}$$

$$1-\frac{6x}{7} = \frac{1}{4}$$

$$\frac{6x}{7} = \frac{3}{4}$$

$$6x = \frac{7 \cdot 3}{4}$$

$$x = \frac{7 \cdot x}{4 \cdot 6_2} = \frac{7}{4 \cdot 2} = \frac{7}{8} \approx 0{,}875$$

$x = 0{,}875 = 87{,}5\%$; $1-x = 0{,}125 = 12{,}5\%$