Homework #5

(1) This problem involves the stability diagram (see Fig. 5.7 from the text) and the cavities indicated on the attached handout (Fig. 7.1 from Yariv).

(a) Find the equation for the dashed lines by considering a general confocal cavity (not simply a symmetric one).

(b) Find the largest region on the stability diagram that corresponds to each cavity. (Note the cavities are labeled from #1 to #8 on the figure. Please follow this notation in your answer.)

(2) 5.8

(3) 5.11

(4) 5.14 (Siegman has a nice treatment of sensitivity to misalignment.)

(5) 5.15 (My answer differs from the text by a factor of 4. See what you get.)

Yariv QE (corrected)

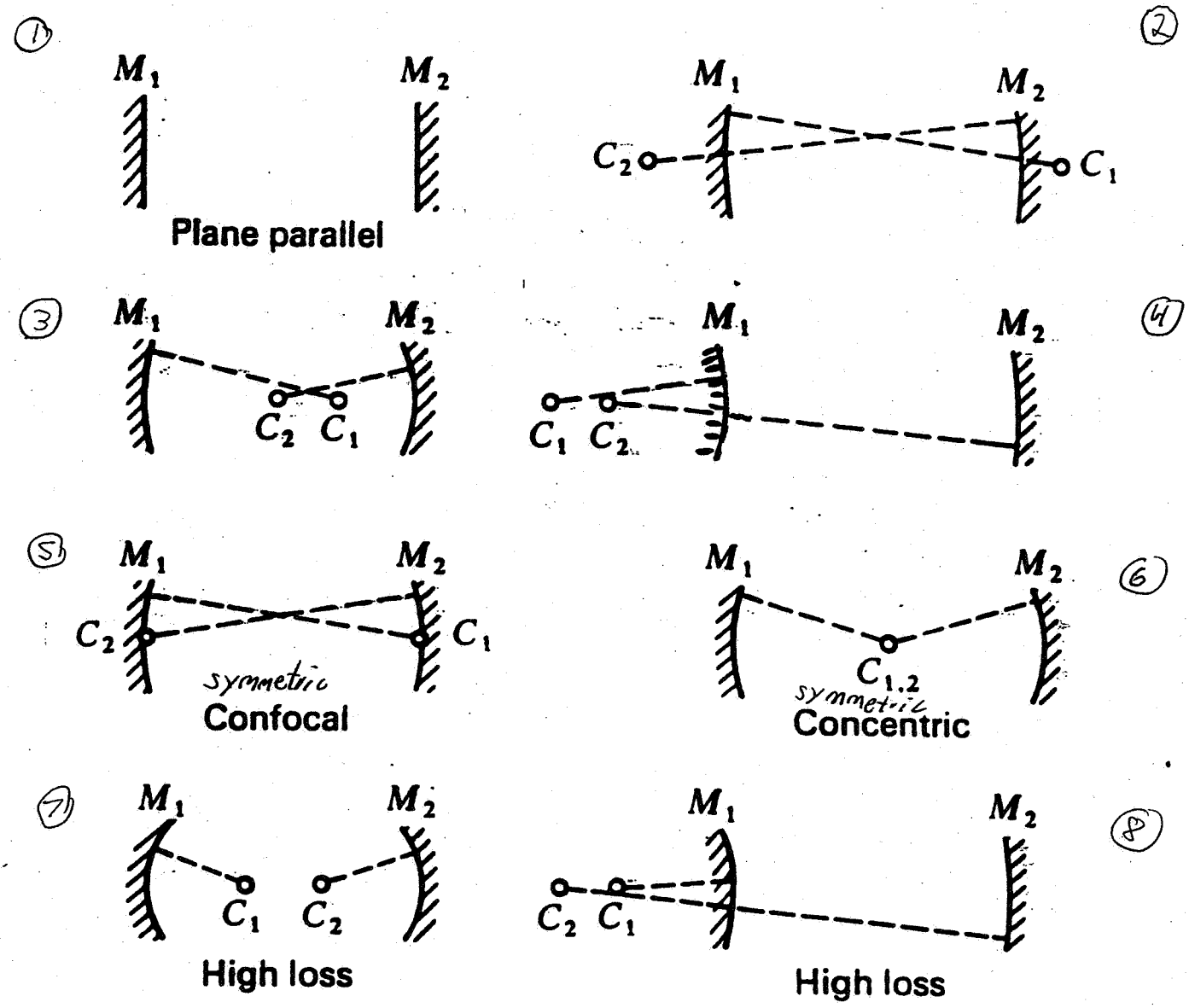

FIGURE 7.1 Examples of mirror configurations for optical masers. All except the bottom two exhibit low-loss resonant modes. *Source:* Reference 3.