

1.  $3\frac{3}{5}$  hr
  
2. We need to change our information into rates, which we can work with. The computer expert does  $\frac{1}{6}$  of the job every hour, while his secretary can do  $\frac{1}{7}$  of the same job in an hour. The expert works on the job for 2 hours, finishing  $2 \times \frac{1}{6} = \frac{1}{3}$  of the job. This means the secretary finishes the other  $\frac{2}{3}$  of the job and takes  $\frac{2}{3} \div \frac{1}{7} = \frac{14}{3} = 4\frac{2}{3}$  hr to finish the job.
  
3.  $8\frac{4}{7}$  hr
  
4. 2 days
  
5. 6 hr
  
6. 30 hr
  
7. Ralph paints  $\frac{1}{4}$  of the house in 1 day while Walter paints  $\frac{1}{6}$  of the house in 1 day. After working 1 day, Ralph finishes  $\frac{1}{4}$  of the house and Walter takes over, finishing the other  $\frac{3}{4}$  of the house. It takes Walter  $\frac{3}{4} \div \frac{1}{6} = \frac{9}{2} = 4\frac{1}{2}$  days to finish the house.
  
8. The larger pipe fills  $\frac{1}{15}$  of the reservoir in 1 day while the smaller pipe can fill  $\frac{1}{20}$  of it in 1 day. After working for 2 days, the larger pipe fills  $2 \times \frac{1}{15} = \frac{2}{15}$  of the reservoir. The smaller pipe begins filling the other  $\frac{13}{15}$  of the reservoir. It takes the smaller pipe a total of  $\frac{13}{15} \div \frac{1}{20} = \frac{52}{3} = 17\frac{1}{3}$  days to finish filling the reservoir.
  
9. The old pump empties  $\frac{1}{8}$  of a tank in 1 hour and a new pump empties  $\frac{1}{4}$  of a tank in 1 hour. After working for 3 hours, the old pump empties  $3 \times \frac{1}{8} = \frac{3}{8}$  of a tank. The new pump empties the other  $\frac{5}{8}$  of the tank in  $\frac{5}{8} \div \frac{1}{4} = \frac{5}{2} = 2\frac{1}{2}$  hr.
  
10. The bricklayer builds  $\frac{1}{8}$  of a wall in 1 day and his helper builds  $\frac{1}{10}$  of a wall in 1 day. The bricklayer works the first 3 days, finishing  $3 \times \frac{1}{8} = \frac{3}{8}$  of the wall. His helper finishes the other  $\frac{5}{8}$  of the wall and it takes him  $\frac{5}{8} \div \frac{1}{10} = \frac{25}{4} = 6\frac{1}{4}$  days.