In exercises 1 to 8, solve each equation for the indicated variable.

1.
$$\frac{1}{x} = \frac{1}{a} - \frac{1}{b}$$
 for x $\frac{ab}{b-a} = \chi$

$$2\left(\frac{1}{x} = \frac{1}{a} + \frac{1}{b}\right)^{2} \text{ for } a$$

$$ab = 2b + 2a$$

$$ab - 2a = 2b$$

3.
$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2}$$
 for R_1

$$\frac{RR_2}{R_2 - R} = R_1$$

4.
$$\frac{1}{F} = \frac{1}{D_1} + \frac{1}{D_2} \text{ for } D_2$$
 $D_1 D_2 = FD_2 + FD_1$

5.
$$y = \frac{x+1}{x-1}$$
 for x

$$\frac{y+1}{y-1} = x$$

6.
$$y = \frac{x-3}{x-2}$$
 for $x = \frac{x-3}{x-2}$ for $x = \frac{x-3}{x-2}$ for $x = \frac{x-3}{x-2}$ for $x = \frac{x-3}{x-2}$ for $x = \frac{x-3}{x-1}$

$$D_2 = \frac{F \Delta_1}{D_1 - F}$$

7.
$$t = \frac{A - P}{Pr}$$
 for P

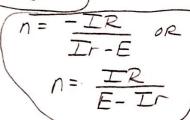
7.
$$t = \frac{A - P}{Pr} \text{ for } P$$
 $P = \frac{A}{1 + r + 1}$

3.
$$I = \frac{nE}{R + nr}$$
 for n

$$R + nr$$

$$R + Trn = nE$$

$$Trn - nE = -TR$$
best control 3 mi





4 mph 9. Motion. A motorboat can travel 20 mi/h in still water. If the boat can travel 3 mi $\frac{1}{2} \sum_{n=1}^{\infty} \frac{1}{2} \sum_{n$ downstream on a river in the same time it takes to travel 2 mi upstream, what is the rate of the river's current?



Motion. A small jet has an airspeed (the rate in still air) of 300 mi/h. During one day's flights, the pilot noted that the plane could fly 85 mi with a tailwind in the same time it took to fly 65 mi against that same wind. What was the rate of the wind? $\frac{65}{300-r} = \frac{85}{300+r} = \frac{65}{300+r} = \frac{40 \text{ mp}}{300+r}$ $\frac{65}{300-r} = \frac{85}{300-r} = \frac{40 \text{ mp}}{300-r}$ 40 mph 10. Motion. A small jet has an airspeed (the rate in still air) of 300 mi/h. During one day's flights the pilot noted that the alarmed 110 mph 10.

150 mph 11. Motion. A plane flew 720 mi with a steady 30-mi/h tailwind. The pilot then returned to the starting point, flying against that same wind. If the round-trip flight took 10 h, what was the plane's airspeed?

> 12. Motion. Janet and Michael took a canoeing trip, traveling 6 mi upstream along a river, against a 2 mi/h current. They then returned downstream to the starting point of their trip. If their entire trip took 4 h, what was their rate in still water? (or +127 6r=12=4r 2-16

17. Motion. An express train and a passenger bus leave the same city, at the same time, r=4for a destination 350 mi away. The rate of the train is 20 mi/h faster than the rate of

the bus. If the train arrives at its destination 2 h ahead of the bus, find each rate. Bus = 50 mph train = 70 mph

18. Motion. A private plane and a commercial plane take off from an airport at the same pp / 120 time for a city 720 mi away. The rate of the private plane is 180 mi/h less than that of cp / 720 r / 720 the commercial plane. If the commercial plane arrives 2 h ahead of the private plane, find each plane's rate. $\frac{720}{r} - \frac{720}{r-180} = 2$ $\frac{720(r-160)-720r}{2r^2-360r} = 2(r-180)$ 19. Work. One road crew can pave a section of highway in 15 h. A second crew, working $\frac{1}{15} + \frac{1}{10} = \frac{1}{10} = \frac{2(r-360)(r+60)}{r-360}$ 18. Motion. A private plane and a commercial plane take off from an airport at the same DD

(0 h

- that same section of highway if both crews worked together?
- 21. Work. An inlet pipe can fill a tank in 10 h. An outlet pipe can drain that same tank in 30 h. The inlet valve is opened, but the outlet valve is accidentally left open. How long will it take to fill the tank with both valves open?

$$\frac{1}{10} - \frac{1}{30} = \frac{1}{t}$$