

MATH 101  
Review on Rational Equations and Word Problems

Solve the following equations. List any restrictions and check for extraneous solutions.

(1)  $\frac{2x}{x+3} = \frac{-6}{x+3} - 2$

(2)  $\frac{x}{x+2} = \frac{3}{2}$

(3)  $\frac{x}{x-2} + 3 = \frac{2}{x-2}$

(4)  $\frac{4}{x-2} = \frac{7}{x^2+3x-10} - \frac{3}{x+5}$

(5)  $\frac{5}{2x-3} = \frac{3}{x+5}$

(6)  $\frac{3}{x-2} = \frac{1}{x-1} + \frac{7}{x^2-3x+2}$

Solve for the indicated variable.

(7)  $C = \frac{5}{9}(F - 32)$  for  $F$

(8)  $\frac{1}{3} - \frac{1}{a} = \frac{1}{b}$  for  $a$

(9)  $xy^2 + xz^2 = xw^2 - 6$  for  $x$

(10)  $\frac{1}{w} + \frac{1}{x} = \frac{1}{y}$  for  $y$

Solve the following word problems.

- (11) It takes a person the same time to drive 150 miles as it takes a plane to fly 1350 miles. If the plane is flying 400 mi/h faster than the car, how fast is each traveling?
- (12) It took a woman the same time to drive 150 miles as it takes a train to travel 250 miles. If the train is traveling 20 mi/h faster than the woman is driving, find the rate at which each is traveling.
- (13) Wilma can mow the lawn in 3 hours. If Kyle helps her with another mower, the lawn can be mowed in 2 hours. How long would it take Kyle if he worked alone?
- (14) Ralph can paint a room in 2 hours, and Joy can paint the same room in 3 hours. If they work together, how long would it take them to paint the room?