

Work on as many problems as you can together with your group members. Towards the end of lecture your group will be asked to present a problem correctly to receive classwork points.

1. Solve and check the linear equation.

(a) $5x - (3x - 8) = 26$

(c) $10 - \frac{x}{2} = \frac{x}{3}$

(b) $3(x - 2) + 8 = 2(x + 5)$

(d) $\frac{11x}{12} = \frac{x}{2} + 5$

2. Complete parts (i) and (ii) for the following equations:

(i) Find the value(s) of the variable that make the denominator zero. These are the restrictions on the variable.

(ii) Keeping these restrictions in mind, solve the equation.

(a) $\frac{4}{5x + 25} = \frac{8}{x + 5} - \frac{2}{5}$

(b) $\frac{2x}{x + 2} = 8 - \frac{4}{x + 2}$

(c) $\frac{1}{x - 3} - \frac{5}{x + 7} = \frac{10}{x^2 + 4x - 21}$

3. Solve the following equations. Determine whether each equation is an identity, conditional equation, or an inconsistent equation.

(a) $5x + 24 = 8(x + 3) - 3x$

(b) $\frac{x + 6}{2} - 7 = \frac{2x - 8}{3}$

(c) $\frac{6x}{x + 2} - \frac{12}{x - 2} = \frac{6x^2 + 24}{x^2 - 4}$

4. Find the value of x satisfying the given conditions:

(a) $y_1 = 5(3x - 5) - 15$, $y_2 = 6(x - 5) + 8$, $y_1 = y_2$

(b) $y_1 = \frac{x - 3}{3}$, $y_2 = \frac{x - 9}{4}$, $y_1 - y_2 = 1$

5. Solve the following word problems:

- (a) When twice a number is decreased by seven, the result is 33. What is the number?
- (b) When three times a number is decreased by six, the result is 30. What is the number?
- (c) When a number is decreased by 40% of itself, the result is 30. What is the number?
- (d) One number exceeds another number by 1. The sum of the numbers is 57. What are the numbers?

6. Find all values of x satisfying the conditions.

(a) $y_1 = \frac{x-4}{4}$, $y_2 = \frac{x-12}{5}$, and $y_1 - y_2 = 1$

(b) $y_1 = 10x - 5$, $y_2 = 6x + 12$, and y_1 exceeds y_2 by 3.

7. According to statistics, a person will devote 31 years to sleeping and watching TV. The number of years sleeping will exceed the number of years watching TV by 19. Over the lifetime, how many years will the person spend watching TV? How many years will they spend sleeping?

8. The length of a new rectangular playing field is 9 yards longer than double the width. If the perimeter of the rectangular playing field is 360 yards, what are its dimensions?

9. City Cabs charges a \$2.75 pickup fee and \$1.50 per mile traveled. Diego's fare is \$17.75. How far did he travel in the cab?

10. Solve for the specified variable:

(a) $v = gh$ for g

(b) $B = \frac{1}{4}h(q+z)$ for q

(c) $m = \frac{t}{f-w}$ for f