

More Systems of Equations #3

Solving Equations and Systems of Equations

Please do exercises on a separate sheet of paper and staple to this sheet.

A. Two Equations, Two Unknowns. Solve for the indicated variables.

1. a. Solve for t and h: (1) $v_y = v_{0y} - g t$ (2) $h = v_{0y} t - \frac{1}{2} g t^2$.

b. Find t and h when $v_{0y} = 30.0 \text{ m/s}$, $v_y = 0 \text{ m/s}$, and $g = 10.0 \text{ m/s}^2$.

2. Solve for a and T: (1) $F - T - m_1 g = m_1 a$ (2) $T - m_2 g = m_2 a$.

B. Three or More Equations, Three or More Unknowns. Solve for the indicated variables.

1. a. Solve for μ in terms of T and w: (1) $T - f = 0$ (2) $n - w = 0$ (3) $f = \mu n$.
(In other words, consider T and w to be the only known variables.)

b. Find μ when $T = 200 \text{ N}$ and $w = 500 \text{ N}$.

2. Solve for I_1 , I_2 , and I_3 : (1) $V_1 - I_1 R_1 - I_3 R_3 = 0$ (2) $V_1 - I_1 R_1 + I_2 R_2 - V_2 = 0$
(3) $I_3 = I_1 + I_2$

3. Solve for μ , T_1 , and T_2 : (1) $T_1 - \mu w_A = 0$ (2) $w_C - T_2 = 0$
(3) $T_2 - \frac{3}{5} w_B - \frac{4}{5} \mu w_B - T_1 = 0$

Evaluate when $w_A = w_B = 30.0 \text{ N}$ and $w_C = 39.6 \text{ N}$.

4. Solve for I_1 , I_2 , I_3 , I_4 , and I_5 : (1) $I_1 = I_4 + I_5$ (2) $I_5 = I_2 + I_3$
(3) $V - I_1 R - I_4(4R) = 0$ (4) $2V + I_1(2R) - I_3(3R) = 0$
(5) $I_4(4R) - I_3(3R) = 0$