Name _____ Score _____ Teacher _____ Date _____

# First-Order Linear and Logistic Equations

For linear equations, show the integrating factor. For logistic equations, give the solution formula, equilibria, units, and long-term behavior.

**1.** **Let P(t) be a population in organisms, with t in years. Solve P' = 1/2P(1-P/180), P(0) = 30; state both equilibria and long-term behavior.**

**2.** **A population P(t), measured in organisms with t in years, follows P' = 1/4P(1-P/180) and P(0) = 90. Find P(t), both equilibria, and the long-term population.**

Show recurrence rows, integrating factors, equilibria, intervals, and units when applicable.

Name _____ Score _____ Teacher _____ Date _____

# First-Order Linear and Logistic Equations

For linear equations, show the integrating factor. For logistic equations, give the solution formula, equilibria, units, and long-term behavior.

**3.** **A concentration C(t), in mg/L, satisfies C' + 3C = 12, C(0) = 7. Find the concentration and its long-term value.**

**4.** **Solve y' + 3y = 9, y(1) = 5. Use an integrating factor and state the maximal interval.**

Show recurrence rows, integrating factors, equilibria, intervals, and units when applicable.