

ANSWER KEY

- | | <u>Form A</u> | <u>Form B</u> |
|-----|---|--|
| 1. | B | C |
| 2. | A | D |
| 3. | A | D |
| 4. | C | B |
| 5. | D | B |
| 6. | A | B |
| 7. | C | A |
| 8. | A | D |
| 9. | (a) Yes | (b) $\frac{\partial M}{\partial y} = 6xy^2 = \frac{\partial N}{\partial x}$ |
| | (c) $x^2y^3 = C$ | (d) $x^2y^3 = 1$ |
| 10. | (a) $\frac{1}{2}v' = 5 - \frac{1}{10}v$, $v(0) = -20$ | (b) $v = 50 - 70e^{-t/5}$ |
| | (c) $\lim_{t \rightarrow \infty} v(t) = 50$ | |
| 11. | (a) $y = -4, 0, 4$ | (b) $y = -4$ is unstable, $y = 0$ is semistable, $y = 4$ is (asymptotically) stable. |
| | (c) $y(0) = -4$, because $y(t) = 4$ is an equilibrium (therefore, constant) solution | (d) $\lim_{t \rightarrow \infty} y = 0$ |
| 12. | (a) $y_c = C_1 + C_2 e^{-4t}$ | |
| | (b) $y = C_1 + C_2 e^{-4t} + \frac{2}{5}e^t + \frac{1}{8}t^2 - \frac{1}{16}t$ | |
| | (c) $Y = (At + B)e^{-4t} \cos 6t + (Ct + D)e^{-4t} \sin 6t + Ete^{-4t}$ | |
| 13. | (a) $k = 25$ | (b) $\gamma = 20$ |
| | (d) True | (c) $\omega_0 = 3$ |
| | (e) $\mu = \frac{\sqrt{11}}{10}$ | |