

ANSWER KEY

1. C
2. D
3. D
4. C
5. C
6. A
7. (a) $y = 0, 5, 10$
(b) $y = 0$ is (asymptotically) stable, $y = 5$ is unstable, and $y = 10$ is (asymptotically) stable.
(c) $\lim_{t \rightarrow \infty} y(t) = 10$
(d) $y(21) = 10$
8. (a) $\alpha = 2$
(b) $x^5 y^2 + e^{xy} - 4y = -19$
9. (a) $y(t) = 6e^t - e^{6t}$
(b) $\lim_{t \rightarrow \infty} y(t) = -\infty$
10. (a) $y_c = C_1 e^{2t} \cos 2t + C_2 e^{2t} \sin 2t$
(b) $Y = Ae^{2t} + Bt^2 + Ct + D + E \cos 2t + F \sin 2t$
(c) $Y = Ate^{2t} \cos 2t + Bte^{2t} \sin 2t + C$
(d) $Y = (At^2 + Bt + C)e^{-t} \cos 5t + (Dt^2 + Et + F)e^{-t} \sin 5t$

11. $y(t) = -\sqrt{\frac{1}{2}te^{2t} - \frac{1}{4}e^{2t} + \frac{17}{4}}$

12. $y(t) = C_1 t^3 + C_2 t^{-1}$