

In Exercises 1–10 determine whether or not each of the given equations is exact; solve those that are exact.

1. $(3x + 2y) dx + (2x + y) dy = 0.$

2. $(y^2 + 3) dx + (2xy - 4) dy = 0.$

3. $(2xy + 1) dx + (x^2 + 4y) dy = 0.$

4. $(3x^2y + 2) dx - (x^3 + y) dy = 0.$

5. $(6xy + 2y^2 - 5) dx + (3x^2 + 4xy - 6) dy = 0.$

6. $(\theta^2 + 1)\cos r dr + 2\theta \sin r d\theta = 0.$

7. $(y \sec^2 x + \sec x \tan x) dx + (\tan x + 2y) dy = 0.$

8. $\left(\frac{x}{y^2} + x\right) dx + \left(\frac{x^2}{y^3} + y\right) dy = 0.$

9. $\left(\frac{2s - 1}{t}\right) ds + \left(\frac{s - s^2}{t^2}\right) dt = 0.$

10. $\frac{2y^{3/2} + 1}{x^{1/2}} dx + (3x^{1/2}y^{1/2} - 1) dy = 0.$