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$$f(x,y) = 8x^5y^6 + 7x^8y^4$$

$$f_x(x,y) = 40x^4y^6 + 56x^7y^4$$

$$f_y(x,y) = 48x^5y^5 + 28x^8y^3$$

$$f_{xx}(x,y) = 160x^3y^6 + 392x^6y^4$$

$$f_{yy}(x,y) = 240x^5y^4 + 84x^8y^2$$

$$f_{xy}(x,y) = 240x^4y^5 + 224x^7y^3$$

$$f_{yx}(x,y) = 240x^4y^5 + 224x^7y^3$$

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$$f(x,y) = x^2 - 6xy + y^2 + 16y + 7$$

$$f_x(x,y) = 2x - 6y$$

$$f_y(x,y) = -6x + 2y + 16$$

$$2x - 6y = 0 \Rightarrow x = 3y$$

$$-6x + 2y + 16 = 0 \Rightarrow -6(3y) + 2y + 16 = 0$$

$$= -16y = -16$$

$$\Rightarrow \begin{cases} y = 1 \\ x = 3 \end{cases}$$

Critical point: (3, 1)

$$f_{xx}(x,y) = 2$$

$$f_{yy}(x,y) = 2$$

$$f_{xy}(x,y) = -6$$

$$D = f_{xx}(x,y) \cdot f_{yy}(x,y) - (f_{xy}(x,y))^2$$

$$= 2 \cdot 2 - (-6)^2$$

$$= 4 - 36 = -32 < 0$$

$f(3,1)$ is a saddle point