18. Two numbers x and y are such that $x + y = 20$ and $\frac{1}{x} + \frac{1}{y} = \frac{1}{2}$. What is the value of $x^2y + xy^2$?

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18. E Multiplying $\frac{1}{x} + \frac{1}{y} = \frac{1}{2}$ throughout by $2xy$ gives $2y + 2x = xy$. Hence $xy = 2(x + y)\ldots$ (1).
But since $x^2y + xy^2 = xy(x + y)$, we can use (1) to give $xy(x + y) = 2(x + y)(x + y)$.
But $x + y = 20$, hence $x^2y + xy^2 = 2 \times 20^2 = 800$.