



23. What is the minimum value of $x^2 + y^2 + 2xy + 6x + 6y + 4$?

A -7

B -5

C -4

D -1

E 4

1193



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23. **B** $x^2 + y^2 + 2xy + 6x + 6y + 4 = (x + y)^2 + 6(x + y) + 4 = [(x + y) + 3][(x + y) + 3] - 5 = (x + y + 3)^2 - 5$. But $(x + y + 3)^2 \geq 0$ for all values of x and y . As $x + y + 3$ can be 0 for appropriate values of x, y the minimum value of $x^2 + y^2 + 2xy + 6x + 6y + 4$ is -5 .