COMPLETING THE SQUARE

In questions **1–4** and **6–13**, write the number to be added to complete the square.

1 $x^2 + 4x$ **2** $x^2 - 6x$ **3** $x^2 + 14x$ **4** $x^2 + 2x$

① 4 as $(x+2)^2 = x^2 + 4x + 4$

② 9 as $(x-3)^2 = x^2 - 6x + 9$

③ 49 as $(x+7)^2 = x^2 + 14x + 49$

④ 1 as $(x+1)^2 = x^2 + 2x + 1$

6 $x^2 - x$ **7** $x^2 + 5x$ **8** $x^2 + 3x$ **9** $x^2 - 7x$

⑥ $\frac{1}{4}$ as $\left(x - \frac{1}{2}\right)^2 = x^2 - x + \frac{1}{4}$

⑦ $\left(\frac{5}{2}\right)^2 = \frac{25}{4}$ as $\left(x + \frac{5}{2}\right)^2 = x^2 + 5x + \frac{25}{4}$

⑧ $\left(\frac{3}{2}\right)^2 = \frac{9}{4}$ as $\left(x + \frac{3}{2}\right)^2 = x^2 + 3x + \frac{9}{4}$

⑨ $\left(\frac{7}{2}\right)^2 = \frac{49}{4}$ as $\left(x - \frac{7}{2}\right)^2 = x^2 - 7x + \frac{49}{4}$

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10 $x^2 + x$ **11** $x^2 + 2ax$ **12** $x^2 - 2bx$ **13** $x^2 + cx$

(10) $\frac{1}{4}$ as $\left(x + \frac{1}{2}\right)^2 = x^2 + x + \frac{1}{4}$

(11) a^2 as $(x + a)^2 = x^2 + 2ax + a^2$

(12) b^2 as $(x - b)^2 = x^2 - 2bx + b^2$

(13) $\frac{c^2}{4}$ as $\left(x + \frac{c}{2}\right)^2 = x^2 + cx + \frac{c^2}{4}$

14 The square is completed for the expression $x^2 - ax$. Indicate whether the following statements would be correct or incorrect.

(a) $x^2 - ax + \frac{a^2}{2}$ **(b)** $x^2 - ax + \frac{a^2}{4}$ **(c)** $\left(x - \frac{a}{2}\right)^2$ **(d)** $x^2 - ax + a^2$

$\left(x - \frac{a}{2}\right)^2 = x^2 - ax + \frac{a^2}{4}$ so **b**