

Using the method of completing the square, find (i) the coordinates of the vertex of the graph, and (ii) the maximum or minimum value of each of the following quadratic functions.

1. $y = x^2 + 13x - 13$

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2. $y = x^2 + 7x + 4$

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3. $y = x^2 - 2x - 6$

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4. $y = x^2 - 4x + 7$

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5. $y = x^2 - 10x - 5$

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6. $y = x^2 - 9x - 13$

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7. $y = x^2 - 3x - 15$

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8. $y = x^2 - 6x + 3$

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9. $y = x^2 + 14x + 3$

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10. $y = x^2 - 9x - 13$

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11. $y = -2x^2 - 5x + 7$

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12. $y = -2x^2 - 10x + 13$

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13. $y = 3x^2 + 7x - 11$

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14. $y = -2x^2 - 7x - 1$

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15. $y = 4x^2 - 10x + 5$

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16. $y = -4x^2 - 12x + 3$

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17. $y = -x^2 - 2x - 10$

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18. $y = -2x^2 - 4x - 18$

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19. $y = 3x^2 + 9x - 1$

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20. $y = 3x^2 - 10x + 13$

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