Answer key

The method: The vertex from standard form

The vertex is at x = −b ÷ 2a. Put that x back in to find y.

$y = x^2 + 2x + 9$ vertex: $(-1, 8)$

$\frac{-2}{2(1)} = -1$ x = −b ÷ 2a

$y = (-1)^2 + 2(-1) + 9 = 8$ put x = −1 back in

vertex $(-1, 8)$; axis of symmetry $x = -1$

$y = -2x^2 + 24x - 78$ vertex: $(6, -6)$

$\frac{-24}{2(-2)} = 6$ x = −b ÷ 2a

$y = -2(6)^2 + 24(6) - 78 = -6$ put x = 6 back in

vertex $(6, -6)$; axis of symmetry $x = 6$

Problems 1 and 2 worked out · Version 0A

$y = -2x^2 + 4x + 8$ vertex: $(1, 10)$

$\frac{-4}{2(-2)} = 1$ x = −b ÷ 2a

$y = -2(1)^2 + 4(1) + 8 = 10$ put x = 1 back in

vertex $(1, 10)$; axis of symmetry $x = 1$

$y = 3x^2 + 30x + 87$ vertex: $(-5, 12)$

$\frac{-30}{2(3)} = -5$ x = −b ÷ 2a

$y = 3(-5)^2 + 30(-5) + 87 = 12$ put x = −5 back in

vertex $(-5, 12)$; axis of symmetry $x = -5$

The vertex from standard form · Version 0A

1) (1, 10) 2) (−5, 12) 3) (1, −2) 4) (2, −10)
5) (4, 4) 6) (−4, 7) 7) (2, −7) 8) (4, −2)
9) (−1, −4) 10) (1, −7) 11) (−4, 10) 12) (5, 5)
13) (3, 12) 14) (6, −4)