ANSWERS ⇝ Completing the Square Worksheet

① $x^2+14x+50$

↳ $y = x^2+14x+50$

$y-50 = (x^2+14x)$

$y-50+49 = (x^2+14x+49)$

$y-1 = (x+7)^2$ {TF}

OR

$y = (x+7)^2+1$ {SF}

② x^2-4x+6

↳ $y = x^2-4x+6$

$y-6 = (x^2-4x)$

$y-6+4 = (x^2-4x+4)$

$y-2 = (x-2)^2$ {TF}

OR

$y = (x-2)^2+2$ {SF}

③ $x^2+30x+250$

↳ $y = x^2+30x+250$

$y-250 = (x^2+30x)$

$y-250+225 = (x^2+30x+225)$

$y-25 = (x+15)^2$ {TF}

OR

$y = (x+15)^2+25$ {SF}

④ x^2-6x

↳ $y = x^2-6x$

$y+9 = (x^2-6x+9)$

$y+9 = (x-3)^2$ {TF}

OR

$y = (x-3)^2-9$ {SF}

⑤ x^2+7x

↳ $y = x^2+7x$

$y + {}^{49}/_4 = (x^2+7x+{}^{49}/_4)$

$y + {}^{49}/_4 = (x+{}^7/_2)^2$ {TF}

OR

$y = (x+{}^7/_2)^2 - {}^{49}/_4$

⑥ x^2+5x+4

↳ $y = x^2+5x+4$

$y-4 = (x^2+5x)$

$y-4+{}^{25}/_4 = (x^2+5x+{}^{25}/_4)$

$y-{}^{16}/_4+{}^{25}/_4 = (x+{}^5/_2)^2$

$y+{}^9/_4 = (x+{}^5/_2)^2$ {TF}

OR

$y = (x+{}^5/_2)^2 - {}^9/_4$

⑦ $y = 2x^2+12x+15$

$y-15 = 2(x^2+6x)$

$y-15+18 = 2(x^2+6x+9)$

$y+3 = 2(x+3)^2$

$\frac{1}{2}(y+3) = (x+3)^2$ {TF}

OR

↳ $y = 2(x+3)^2-3$ {SF}

⑧ $y = 4x^2-16x+30$

$y-30 = 4(x^2-4x)$

$y-30+16 = 4(x^2-4x+4)$

$y-14 = 4(x-2)^2$

$\frac{1}{4}(y-14) = (x-2)^2$

OR

↳ $y = 4(x-2)^2+14$

⑨ $y = 3x^2+12x+11$

$y-11 = 3(x^2+4x)$

$y-11+12 = 3(x^2+4x+4)$

$y+1 = 3(x+2)^2$

$\frac{1}{3}(y+1) = (x+2)^2$ {TF}

OR

$y = 3(x+2)^2-1$ {SF}

⑩ $y = -x^2+4x+5$

$y-5 = -(x^2-4x)$

$y-5-4 = -(x^2-4x+4)$

$y-9 = -(x-2)^2$

$-(y-9) = (x-2)^2$ {TF}

OR

$y = -(x-2)^2+9$ {SF}

⑪ $y = -x^2+6x+5$

$y-5 = -(x^2-6x)$

$y-5-9 = -(x^2-6x+9)$

$y-14 = -(x-3)^2$

$-(y-14) = (x-3)^2$ {TF}

$y = -(x-3)^2+14$

⑫ $y = -2x^2+12x-9$

$y+9 = -2(x^2-6x)$

$y+9-18 = -2(x^2-6x+9)$

$y-9 = -2(x-3)^2$

$\frac{-1}{2}(y-9) = (x-3)^2$ {TF}

OR

$y = -2(x-3)^2+9$ {SF}