

#3



①  $y = 3(x-2)(x+6)$

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

$y = 3x^2 + 12x - 36$

b)  $y + 36 = 3(x^2 + 4x + 4)$

$y + 48 = 3(x+2)^2$

$y = 3(x+2)^2 - 48$

c)  $y = 3(x-2)(x+6)$

d)  $(2, 0)(-6, 0)$

e)  $(0, -36)$

f)  $(-2, 48)$

g)  $x = -2$

h) Vertical stretch 3

left 2

Down 48

i)  $(-2, \infty)$

j)  $(-\infty, -2)$

k)  $\mathbb{R}$

l)  $[-48, \infty)$

m) Below

n) No

o) UP

② a)  $y = -2x^2 + 8x - 6$

b)  $y + 6 = -2(x^2 - 4x + 3)$

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

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

c)  $y = (-2x+2)(x-3)$

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

$y = -2(x-3)(x-1)$

d)  $(3, 0)(1, 0)$

e)  $(0, -6)$

f)  $(2, 2)$

g)  $x = 2$

h) Vertical stretch 2

Flip vertically

Right 2

UP 2

i)  $(-\infty, 2)$

j)  $(2, \infty)$

k)  $\mathbb{R}$

l)  $(-\infty, 2]$

m) Above

n) No

o) Down

③ a)  $y = 4(x-1)^2 - 1$

$y = 4(x^2 - 2x + 1) - 1$

$y = 4x^2 - 8x + 4 - 1$

$y = 4x^2 - 8x + 3$

b)  $y - 3 = 4(x^2 - 2x + 1)$

$y + 1 = 4(x-1)^2$

$y = 4(x-1)^2 - 1$

c)  $y = (4x^2 - 6x) + (-2x + 3) - 1/2$

$y = 2x(2x-3) - 1(2x-3)$

$y = (2x-3)(2x-1)$

d)  $(3/2, 0)(1/2, 0)$

e)  $(0, 3)$

f)  $(1, -1)$

g)  $x = 1$

h) vertical stretch 4

Right 1

UP 1

i)  $(1, \infty)$

j)  $(-\infty, 1)$

k)  $\mathbb{R}$

l)  $(-1, \infty)$

m) Below

n) No

o) UP

#4

①  $y = 3(2(x-1))^2 + 18$

a)  $3(2x-2)^2 + 18 = y$

$3(4x^2 - 8x + 4) + 18 = y$

$y = 12x^2 - 24x + 12 + 18$

$y = 12x^2 - 24x + 30$

b)  $y = 3(2(x-1))^2 + 18$

c) skip

d)  $-18 = 3(2(x-1))^2$

$-6 = (2(x-1))^2$

$\sqrt{6}i = |2x-2|$

$2x-2 = \sqrt{6}i$   $2x-2 = -\sqrt{6}i$

$2x = 2 + \sqrt{6}i$   $2x = 2 - \sqrt{6}i$

$x = 1 + \frac{\sqrt{6}}{2}i$   $x = 1 - \frac{\sqrt{6}}{2}i$

$(1 + \frac{\sqrt{6}}{2}i, 0)$   $(1 - \frac{\sqrt{6}}{2}i, 0)$

e)  $(0, 30)$

f)  $(1, 18)$

g)  $x = 1$

h) Vertical stretch 3

Horizontal Shrink  $\frac{1}{2}$

Right 1

UP 18

i)  $(1, \infty)$

j)  $(-\infty, 1)$

k)  $\mathbb{R}$

l)  $(18, \infty)$

m) Below

n) No

o) UP

②  $y = -\frac{1}{2}x^2 - x + 12$

a)  $-\frac{1}{2}x^2 - x + 12 = y$

b)  $y = -\frac{1}{2}(x^2 + 2x + 1)$

$y - 12 = -\frac{1}{2}(x+1)^2$

$y - 12.5 = -\frac{1}{2}(x+1)^2$

$y = -\frac{1}{2}(x+1)^2 + 12.5$

c)  $-12.5 = -\frac{1}{2}(x+1)^2$

$15 = (x+1)^2$

$\sqrt{15} = |x+1|$

$x+1 = \sqrt{15}$   $x+1 = -\sqrt{15}$

$x = -1 + \sqrt{15}$   $x = -1 - \sqrt{15}$

$y = (x - (-1 + \sqrt{15}))(x - (-1 - \sqrt{15}))$

d)  $(-1 + \sqrt{15}, 0)$   $(-1 - \sqrt{15}, 0)$

e)  $(0, 12)$

f)  $(-1, 12.5)$

g)  $x = -1$

h) Vertical Shrink  $\frac{1}{2}$

Flip Vertically

Left 1, up 12.5

i)  $(-\infty, -1)$

j)  $(-1, \infty)$

k)  $\mathbb{R}$

l)  $(-\infty, 12.5)$

m) Above

n) No

o) Down

③  $y = 4(x-2)(x+10)$

$y = 4(x^2 + 8x - 20)$

$y = 4x^2 + 32x - 80$

b)  $y + 80 = 4(x^2 + 8x + 16)$

$y + 144 = 4(x+4)^2$

$y = 4(x+4)^2 - 144$

c)  $y = 4(x-2)(x+10)$

d)  $(2, 0)$   $(-10, 0)$

e)  $(0, -80)$

f)  $(-4, -144)$

g)  $x = -4$

h) Vertical stretch 4

Left 4

Down 144

i)  $(-4, \infty)$

j)  $(-\infty, -4)$

k)  $\mathbb{R}$

l)  $[-144, \infty)$

m) Below

n) No

o) UP