

3/8 Algebra 1 - Downing

Go over HW + NB Quiz

Lesson 4: Transforming Quadratics

$$y = a(x-h)^2 + k$$

Transformations come from the parent function $y = x^2$



$a > 0$ → opens up (+) or down (-)

$a > 1$ → stretch (narrow)

$a < -1$ →

$-1 < a < 1$ → compression (wide)
(fractions smaller than 1)

$a = 1$ → normal $a \neq 0$

$a = -1$ →

* Reflected = opens down (flipped) a is negative

Vertex (h, k)

* shift left/right (h)

* shift up/down (k)

Describe the transformation:

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

• opens down

• normal ($a=1$)

• vertex $(3, 2)$

• right 3, up 2

Ex) $y = -\frac{1}{2}(x+7)^2$

• opens down

• compressed

• vertex $(-7, 0)$

• shifted left 7

Ex) $y = x^2 - 5$

• opens up

• normal

• vertex $(0, -5)$

• down 5

$$y = a(x-h)^2 + k$$

Write the quadratic equation:

Ex) Opens down, stretched, shifted left 2 and up 2

$$y = -2(x+8)^2 + 2 \quad (-8, 2)$$

Ex) Opens up, wide, shifted down 1 right 4

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

Ex) Normal, reflected, vertex at (6, 0)

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

* Transforming Quadratics WS

* PC #1 Review WS Unit 7